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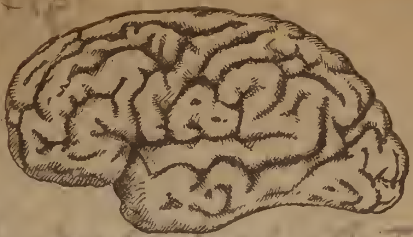

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ALIENIST AND NEUROLOGIST

Vol. XXXVIII. St. Louis, February, 1917. No. 1.

HEINE-MEDIN'S DISEASE. WITH MEDIN'S ORIGINAL DESCRIPTIONS FROM THE SWEDISH. III.*

By Smith Ely Jelliffe, M. D., and E. A. Dederer, M. D.

Part III.

The Symptoms and Course of the Acute Stage

I. Constitutional Symptoms. With the exception of the lassitude a few days before the onset in case LXIII, no prodromal symptoms appeared in the cases described here. Other observers have reported insomnia, irritability, anorexia, troublesome dentition, etc.

A prodromal stage I have only found in cases XXIII, LI, LVI, and LVII. In the first of these the child, a boy 19 months old, became ill on Sept. 4 with fever and general malaise, but was apparently well again the following day. On Sept. 8, five days after the first signs, he had high fever. This was one of the severest cases that I have attended, though the ultimate result was surprisingly good. In the other three cases fever, vomiting and general despression were noted two to four days before the onset.

Fever was present in the great majority of cases at the onset, being absent in only two of the 43 cases which occurred during 1887, namely the first case which developed in May, and in the last case in October. The average duration of the fever is from two to four days. Regarding the temperature curve I can only say that it is variable but seldom rises beyond 39°C. In case XXII the temperature rose to 41.4° a few hours before death.

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*Continued from August, 1916.

Profuse perspiration was observed in very few cases. Somnolence is a characteristic feature, present in all the cases, though in degrees varying from drowsiness to stupor, and, in fatal cases, to coma. The somnolence in poliomyelitis is analagous to the typhoid state observed in most infectious diseases. It is an early sign, sometimes preceding the fever. It is more apt to deepen to stupor in polioencephalitis, but may be as pronounced in simple poliomyelitis. Undoubtedly the early appearance of somnolence is due to a functional disturbance from irritation of the cerebral cortex by toxins, and its transitory character is in line with the frequently transitory affection of the motor nerve apparatus.

Angina has been present in some cases at the onset. Indigestion is a fairly common sign at the onset. Vomiting was present in ten cases only, but anorexia and mucous, fetid stools were frequent, indicating an acute catarrhal condition of the intestines during the febrile stage. In the fatal cases, the autopsies revealed pronounced catarrh of the intestines with swelling of the solitary follicles, Peyer's patches and mesenteric lymph glands.

Constipation is a common symptom during the acute stage, and is undoubtedly due to the nervous disturbances, as it lasted five days in one case, four days in two cases, and in the majority of cases for about three days. In the cases No. 47 and 55 daily enemata were given for a week before there was a natural movement. Involuntary defecation during the acute stage did not occur in any case.

There is occasionally retention of urine towards the end of the febrile stage. Catherization had to be resorted to for three days in cases No. 29 and 47. The retention is due without question to faulty innervation of the bladder, as no disturbances are observed during the paralytic stage.

I wish to emphasize a symptom frequently observed during the febrile stage, and sometimes during the period of restitution, and which has not been brought out in the descriptions of the disease, namely the pain and tenderness, especially in the legs, which is elicited during the examination. It is seen in cases of typical poliomyelitis as well as in those in which the polyneuritic symptoms are dominant.

Convulsions during the onset occurred in five cases only, so my experience does not confirm the observations of other writers. Tremor and convulsive movements of the extremities are extremely rare in typical cases. They are seen in poliencephalitis and in cases associated with polyneuritis, as in cases No. 16, 19, 26 and 54. The atypical cases offer the best prognosis; hence, tremors, cramps and convulsions are far from sinister symptoms. I have never seen true contracture; only pseudocontractures from the pains in muscles and nerves.

Sighing respirations and the hydrocephalic cry have been observed only in cases in which the symptoms of encephalitis predominate.

Cases 29 and 33 present somewhat unusual features. An inferior paraplegia developed during the initial febrile stage which lasted three and four days respectively, and was followed by a period of remission lasting five days, which, in turn, was followed by fever and aggravation of the paraplegic symptoms.

2. LOCALIZATION IN THE NERVOUS SYSTEM DURING THE ACUTE STAGE. In the majority of cases one can not distinguish sharply between the febrile and the paralytic stage. We can more accurately speak of a febrile stage and a stage of restitution which is generally followed by a paralytic or atrophic stage. It is certain that the acute stage shows symptoms of motor disturbances, as well as of general intoxication.

The localization of the anatomical lesions in typical acute anterior poliomyelitis needs no discussion here. I shall merely mention that during the epidemic of 1887 there were 28 typical cases in Stockholm, and 13 in 1895. These cases are chiefly of interest as showing that the second epidemic was in reality one of the same diseases as the first one, although the atypical cases predominated. It is doubtful if the true nature of such cases would have been recognized, had they not appeared during an epidemic of anterior poliomyelitis.

The vast majority of the typical cases show a localization in the lumbar region of the cord with inferior paraplegia indicating a predilection of the virus for the lumbar ganglion cells. There were 45 cases of inferior paraplegia, while the upper extremities were involved in 14. The pathological process shows a tendency to spread in the vertical direction, involving the muscles of the thorax and abdomen. In cases 29 and 47 there was a unilateral paralysis of the intercostal and abdominal muscles. The facial nerves, the oculomotor and vagus were involved in several cases. It was interesting to note that bulbar complications thus occur in perfectly typical cases.

The acute polyneuritic form is characterized by intense pain and by tenderness in the entire body, but especially severe in the legs. Polyneuritis is rare in children and had never come under my personal observation before 1887. When, during August and September, I saw not less than six cases [6, 11, 16, 19, 26, 33,] presenting the typical picture of polyneuritis as decribed by Dumenil, Dejerine, Leyden, Strumpbell, Eisenlohr, Babinski and others. In 1895 there were two similar cases, 47 and 54, and in two others, 51 and 64, the signs are suspicious.

The genetic connection between poliomyelitis and polyneuritis has already been pointed out by Strümpell, Leyden and Eisenlohr. That the two diseases are carried by the same agent is brought out by other factors than their simultaneous appearance, as the mode of onset, gastro-intestinal disturbances, the duration of the febrile stage, the age at which the children are affected, and, finally, the motor disturbances with weakness of the lower extremities observed in polyneuritis.

In addition to the marked tenderness and pain, the cutaneous hyperesthesia—in one case followed by complete anesthesia of the lower extremities—shows that the localization of the virus is not confined to the anterior horn. In most cases the sensory disturbances disappeared during the atrophic stage, whereas the pain and tenderness remained. In cases 6, 11, 64, there were moderate contractures of the hip and knee joints, and attempts to straighten the leg caused intense pain, and the children cried with pain at every attempt to stand. Despite the severity of the acute symptoms the ultimate result was good, which is unusual in simple polyneuritis.

The ataxic type (see cases 16, 19, 26, 54 and 33) is characterized by muscular spasms and tremors, and at the same time the motor disturbances assume the features of ataxia. Case 54 presented marked ataxia with a few spastic phenomena, and this case may be regarded as a transition form. In case 33 the reverse obtained. It is regrettable the the low age of the children made a careful examination of the cutaneous and deep muscular sense impracticable.

How are the ataxic symptoms to be explained? In all cases presenting symptoms of ataxia the polyneuritic character of the disease was marked from the very onset. This question cannot be answered until physiologists have determined what centers control the coordination. It is not impossible that the ataxia results from lesions of the spinal cord. Nevertheless, as peripheral sensory nerve irritation was evident, I am inclined to regard the ataxia as a manifestation of polyneuritis. Leyden, who first described ataxia in polyneuritis, advanced the hypothesis that a lesion of functional disturbance of the sensory tracts leads to a diminution of or loss of the control which the deep muscular sense exercises over the coordination centers. This hypothesis of the production of ataxic symptoms is applicable to our cases. The degree of ataxia probably corresponds to the degree of involvement of the motor nerves. The clinical picture of polyneuritis with ataxic symptoms has been described under different names by different observers. Strumpbell calls it acute curable ataxia, and Dejerine speaks of peripheral pseudotabes, or peripheral neurotabes. [Gazette de Paris, 1883, p. 44.]

The atxaic gait in these cases of infantile paralysis does not resemble the ataxic gait in tabes. A tabetic has an uncertain gait, as though he had lost the sense of position of his legs and did not know where to place his feet. The polyneuritic children stumble, fall easily, walk with the legs far apart and have obviously great difficulty in not losing their balance. In other words, the gait in the polyneuritic type resembles the gait in cerebellar ataxia, or in Friedrich's ataxia.

Regarding the lesions of the nervous system in polyneuritis it is noteworthy that Rissler found degeneration of the ganglion cell of Clarke's columns, in case 22. Degeneration of Clarke's columns causes a secondary degeneration of the lateral columns as far as the cerebellum, and of Gower's column. These are precisely the changes found in hereditary Friedrich's ataxia.

In two of these cases there were slight and transitory disturbances of speech, faulty articulation and stuttering, possibly due to peripheral disturbances.

In the simple polyneuritis type there is no atrophy. The only cases with atrophic changes were those more closely approaching the polyomyelitic type, as in 51 or 64. Cyanosis and coldness of the extremities were also lacking, as in the other ataxic conditions.

Another interesting feature is the absence of the reaction of degeneration and the normal or increased patellar reflex in polyneuritis. The latter symptom is not often seen in typical polyneuritis, but does occur. Strümpell and Mobius called attention to it in Munch. med. Wochenschrift, 1886. XXXIII.

Involvement of the cranial nerves is rare in polyneuritis. Nevertheless, two out of the total eight cases presented a paralysis of the abducens and facial nerves. This is one of the characteristics of infantile paralysis cropping out from time to time in the various types.

Acute bulbar poliomyelitis. Both epidemics proved that infantile paralysis may attack the cranial nerves, the medulla oblongata, pons, and even the oculomotor.

It has ever been an article of faith that the cranial nerves are never involved in infantile paralysis. Leyden denies emphatically that the facial hypoglossus or eye muscles are ever affected. [Klinik d. Rückenmarkskrankheiten, Berlin, 1875, II, p. 555] and that the paralysis ever extends to the medulla oblongata.

Several English writers mention facial paralysis, also Henoch, Volkmann, Seligmuller, Seguin and Sinkler. A case of facial paralysis with atrophy of the ganglion is described by Eisenlohr [Arch. f. Psychiatrie u. Nervenkr., IX & X.] It is of great interset to note that in Badham's description of the four cases which he observed in 1836, and which were the incentive to Heine's study of the disease, he speaks of strabismus in one case, dilated left pupil in the second case, and dilated right pupil in the third. There is no doubt that Badham's cases were infantile paralysis. Several attempts have been made to prove that they belonged to acute polioencephalitis, and to disprove their relation to infantile paralysis, but in view of later observations, such theories are no longer tenable. Wernicke has spoken of acute superior policencephalitis and acute inferior poliencephalitis. The former is analagous to those cases of infantile paralysis in which the eye muscles are involved and the latter to those involving the lower cranial nerves. I do not know if Wernicke's cases present other similarities to infantile paralysis. There may, of course, be other factors causing an acute inflammatory or degenerative process of the cranial nerve.

Facial paralysis occurred in 8 cases in 1887, but in only one in 1895, No. 56. In case 34, which terminated fatally, the facial diplegia was found to result from a similar degeneration of the facial nerve as of the anterior horns. Similar changes were found in the ganglia of the abducens and hypoglossus. One case presented a paralysis of the left abducens and of the upper and lower branches of the left facial, and another case, observed in Sept. 1893, showed the same abducens and facial paralysis. This combination may possibly be due to the close proximity of the respective nuclei in the bulb.

It is clear that isolated facial paralysis, unaccompanied by other symptoms, may be due to infantile paralysis, as in cases 8, 24 and 26. This was first pointed out by Mobius in 1886. It is not improbable that the majority of the cases of idiopathic facial monoplegia or diplegia occurring during the first few years of life should be classified with infantile paralysis. In my experience infantile facial paralysis is not as rare as Hubschmann claims it is. [Neur. Centralbl. 1894, p. 817.]

Next in frequency to the facial nerve is the abducens paralysis. It has been observed in 6 cases, in 28 and 35 with paralysis of the extremities, in 16 with ataxic symptoms, and in 13 and 44 with symptoms of policncephalitis.

Paralysis of the hypoglossal nerve was seen in five cases, two of which showed degeneration of the ganglion.

The muscles of the neck were totally paralyzed in 3 cases, 23, 29, 34, indicating an involvement of the spinal accessory. In 56 the ganglia of the facial, hypoglossal and accessory were without question affected, and possibly also the oculomotor, as one pupil was dilated. Dysplegia was present in one case only, 34.

The vagus was affected in both cases which terminated fatally, and presented the same changes as in the motor ganglia. Sudden dyspnea and cyanosis, and in case 34, aphonia, were the clinical signs. A transitory functional disturbance of the vagus is illustrated in case 23, in which the muscles of the abdomen and the neck, all four extremities and the left facial were completely paralyzed. On the sixth day the child suddenly developed dyspnea with shallow, rapid respirations. The pulse was small, 120. I thought at once of an involvement of the vagus and did not expect the child to recover. The heart and lungs were normal. The following day the respiration was 24 and the pulse 100 and other parts of the nervous system showed signs of improvement.

Similarly in case 47, of the polyneuritic type, there was sudden dyspnea on the fourth day, followed by pulmonary edema which lasted over 24 hours.

The affection of the motor ganglia may spread to the oculomotor ganglion and give rise to external ophthalmoplegia, loss of coordination in the movements of the eye, nystagmus, unequal pupils and modifications of the pupillary reflexes. External ophthalmoplegia was observed in case 34. Unfortunately, the oculomotor ganglion was not examined, but the abducens showed, as I have already stated, degeneration. In case 22 bilateral nystagmus and dilatation of the right pupil developed on the day of death.

In the absence of poliencephalitis it is not likelyt hat the cause is to be found in the cerebral cortex. It is more probably an extension of the pathological process to the ganglia situated near the aqueduct of Sylvius.

Of the cranial nerves the facial is most often affected, and does not necessarily make the prognosis any worse. The same may be said of the abducens. With the other cranial nerves, however, the case is different. Paralysis of the facial nerve may occur alone, without any other manifestation of infantile paralysis. The other cranial nerves are never affected without some accompanying lesion typical of poliomyelitis or polyneuritis, as for instance: inferior paraplegia and oculomotor paralysis; accessory nerve vagus and facial nerve paralysis; hypoglossus and abducens; facial and accessory nerves. Case 47 forms the only exception to this rule, vagus being the only nerve involved.

In case 22, which terminated fatally during the acute stage, the autopsy showed a unilateral lesion of the vagus and bilateral hypoglossus lesion. It is possible that the cranial nerve paralysis in some of these cases, 11, 26, 16, 29 and 47, can be attributed to a peripheral neuritis, although an equally plausible explanation is found in a bulbar poliomyelitis complicating the polyneuritis.

In those cases presenting the characteristic paralysis of acute poliomyelitis it is likely that the changes in the motor ganglia have given rise to paralysis. Physiologically and morphologically, the motor ganglia of the cranial nerves are similar to the anterior gray horns of the spinal cord, and, since the virus of infantile paralysis shows a predilection for the latter, we may well ask why the former may not also be attacked. Abundant clinical and anatomical evidence has been found during these epidemics that the motor ganglia of the cranial nerves are affected in the same manner as the motor ganglia of the spinal cord.

I have no doubt that my observations will be corroborated by many observers as soon as their attention is called to this far from infrequent complication.

Even in the more recent works on infantile paralysis it is emphasized that paralysis of the cranial nerves indicates a cerebral lesion, which excludes the diagnosis of infantile paralysis.

Bulbar poliomyelitis differs in pathological anatomy from poliencephalitis. It is possible for the two conditions to coexist, e. g., facial paralysis in cases of poliencephalitis, but even then the character of the anatomical lesions is essentially different and the facial paralysis is to be regarded as the manifestation of bulbar poliomyelitis.

Acute poliencephalitis, or paralysis of the cerebral cortex, has occurred in several cases during both epidemics of infantile paralysis, which to my mind is a strong evidence that it is caused by the infantile paralysis virus. Cases 13, 14 and 57 present the typical clinical picture of unilateral poliencephalitis: an acute febrile stage with somnolence, hemiplegia with spastic symptoms and exaggerated reflexes. In case 55 there were indications of a more diffuse process with involvement of both hemispheres. Three out of the four cases occurred while the epidemic was at its height, clearly showing the etiological identity. Moreover, there are other symptoms bearing out the relation. There is a certain likeness in the symptoms of acute intoxication in poliencephalitis and poliomyelitis; the localization only is different. The relation between poliomyelitis and poliencephalitis is analagous to laryngeal diphtheria and croup—by many regarded as two different diseases until accurate clinical observations showed their identity. It is now time that we recognize that poliomyelitis, polyneuritis and poliencephalitis are types of the same disease, infantile paralysis. And we shall yet see our observations affirmed by the bacteriologist, for the day is not far away when the common causative agent will be discovered.

Again I wish to emphasize that the complicating abducens paralysis observed in cases 13 and 44 is due to bulbar involvement, not directly to the poliencephalitis.

It is sometimes difficult to determine whether the cortex is involved, as for instance in case 53: typical poliomyelitis, with muscular contraction in the left arm during the acute stage and the left patellar reflex exaggerated during the stage of restitution. The symptoms are not characteristic of poliomyelitis, but of poliencephalitis. It is not improbable that poliencephalitis may complicate any form of infantile paralysis during the acute stage. In case 56 it was unquestionably present in addition to the bulbar paralysis and polyneuritis.

It is noteworthy that the ultimate result is better than one could expect, as three out of four children recovered completely. The fourth child had spastic hemiplegia. It is probable that many cases of poliencephalitis are diagnosed as meningitis.

THE MIXED FORMS. We have seen that the pathological process of infantile paralysis is not always confined to the spinal cord. When the virus simultaneously attacks different portions of the nervous system mixed forms arise.

The following table will show the relative frequency of the mixed forms and of the different combinations of symptoms brought about by an analysis of the 64 cases observed during the epidemics of 1887 and 1895.

The doubtful cases, that is, doubtful as to their being mixed forms, are not included among the mixed forms.

Paralysis, spinal, lumbalis, simplex	32.
Paralysis, spinal, cervicalis	5.
Paralysis, spinal, complete	4.
Paralysis, spinal, lumbalis + n. abducens [28, 35]	2.
Paralysis, spinal, lumbalis + n. oculomotor [40]	1.
Paralysis, spinal, complete + facialis [23]	1.
Paralysis, spinal, complete + facialis + oculomotor [10]	1.
Paralysis, spinal, lumbalis + facialis + polyneuritis [11]	1.
Paralysis, spinal, complete + vagi + polyneuritis [47]	1.
Paralysis, spinal, complete + paralysia bulbi completa [fatal] [22, 34]	2.
Monoplegia facialis [8, 24, 41]	3.
Polyneuritis acuta simplex [6]	1.
Polyneuritis cum ataxia [19, 33, 54]	3.
Polyneuritis cum ataxia + paralysia facialis [26]	1.
Polyneuritis cum ataxia + paralysia nn. abducens et hypogl. [16]	1.
Poliencephalitis acuta [55, 57]	2.
Poliencephalitis acuta + paralysia n. abducens [13, 44]	2.
Poliencephalitis acuta + polyneuritis + paralysia nn., facialis, hypogloss. et accessor [53]	1.
	64.

PROGNOSIS. The simple poliomyelitis has the poorest prognosis, for life as well as for ultimate recovery of motion, and the lumbar poliomyelitis is graver than any other form.

Cervical poliomyelitis is less severe in the acute stage and more rarely leaves permanent paralysis. There were 32 cases of atrophy and paralysis of the lower extremities, as compared with 5 of the arms. I have already called attention to the equally good prognosis of polyneuritis and of acute ataxia. Probably it is just this form of ataxia that was called "heilbar ataxia" by the German observers.

Symptoms of bulbar disturbance in the acute stage are also of short duration. Abducens and the facial nerve have been permanently paralyzed, the former in 3 cases, the latter in 7. On the whole the susceptibility of the facial nerve to the virus of infantile paralysis about equals that of the cervical portion of the cord.

The age of the child is also a factor in the prognosis. Young children, with the possible exception of infants, are more susceptible to the disease and offer poorer prognosis for ultimate results.

One attack seems to confer immunity.

III. PATHOLOGICAL ANATOMY DURING THE ACUTE STAGE.

During Sept. and Oct., 1887, there were 4 fatal cases, one in a woman 21 years of age, and three children.

Signs of general infection. There was slight subcutaneous extravasation of blood in one case, but with that exception similar changes were observed in all cases. The blood was thick and dark. The myocardium cloudy and grayish red [myocarditis] with small hemorrhages underneath the endocardium and also underneath the pleura. The liver was soft with cloudy parenchyma; the cut surface was of a bromide red color with streaks of gray in one case, and another showing acute parenchymatous hepatitis. The spleen was enlarged, soft and friable, with diffuse swelling of the malphigian corpuscles, which were of a reddish gray color, [acute parenchymatous splenitis.] The intestinal mucosa was edematous and hyperemic with enlargement of Peyer's patches and of the solitary follicles. The mesenteric glands were enlarged and of a grayish red color. Peyer's patches were markedly infiltrated, with hyperemic areas, [acute follicular enteritis.]

Pathological changes in the central nervous system. The meninges showed a slight hyperemia. The subarachnoidal fluid was clear. The white substance was normal except for slight hyperemia in one case. Similarly in one case the gray matter of medulla oblongata was distinctly hyperemic. In another case the entire parenchyma of the pons and medulla oblongata was hyperemic and more moist than normally. The spinal cord and canal showed more marked changes. They were most severe in case 34 [five months of age.] The periosteum of the spinal column was intensely hyperemic, as was the dura mater, especially in the cervical and lumbar portions of and around the spinal nerve roots. Extradural hemorrhage in the cervical portion in one case, in the lumbar in the other. The posterior portion of pia mater was hyperemic in the cervical and lumbar regions.

The cord in the 3-year-old child was intensely hyperemic, of a brownish red color with dark striae and points and rising above the gray, gelatinous posterior horns. In the upper part of the lumbar portion was seen a hemorrhage, the size of a pinhead, in the right anterior horn. In the child 5 months old the changes were more intense. Hyperemia in both anterior and posterior horns, and in the left anterior cervical nerve roots. The white matter was edematous in its entire extent. Also marked hyperemia in the anterior horns of the cervical portion, and punctate hemorrhages in the left horn. In the lower portion the same changes were seen and in addition hyperemia and edema ofthe posterior left horn. The gray matter is less hyperemic in the dorsal region, and less in the posterior horns. The left side is more affected. In the lowest portion of the lumbar region ths outlines of the horns are indistinct and the surrounding tissue is hyperemic.

The marked parenchymatous inflammatory changes of the viscera indicate the virulence of the virus of infantile paralysis, since its toxins have such an intense systemic effect. The analogy between the visceral changes in this disease and in the acute stage of the infectious diseases, e. g., scarletina, are obvious. Infantile paralysis has been classified among the acute infectious diseases because of the similarity in the clinical course. Not until now have we been able to place the classification upon an anatomical basis. The question is settled beyond dispute by these autopsy findings.

Clinical observations have shown us that the disease is most severe in infancy, which view is also affirmed by the intenser pathological changes in the five months old child.

I regret that only the spinal cord, medulla and pons were preserved for microscopic examination. At that time I did not realize the extent of the involvement of the nervous system or sections would have been made of the entire nervous system. However, the microscopic examination, which has been made by Rissler, is of especial interest as it is the first report of the changes in the nervous system during the acute stage.

The microscopic examination of the anterior gray horns showed intense hyperemia and exudation, blood vessels distended, filled with blood corpuscles, greatly distended lymph spaces, exudation of all elements of the blood but especially of leucocytes. The leucocytes are massed in the lymph spaces, in the adventitia and around the large vessels. Diapedesis of the red cells, with intact blood vessels, consequently not a true hemorrhage, was seen in the portions most intensely affected. A hemorrhage the size of a pinhead was seen in one of the horns, and there were several punctate hemorrhages observed by the naked eye, but the microscopic section showed very few hemorrhages and it is therefore possible that distended blood vessels appeared microscopically as hemorrhages.

Leucocytes were so numerous in the interstices of the horns that in some sections nothing could be seen but their nuclei, and it is almost impossible to distinguish between the myelin substance and the ganglion cells. The latter are in a state of advanced degeneration. In other sections only a small portion of the horns were affected to this extent, and in some sections the emigration of cells is confined to the tissues immediately surrounding the blood vessels.

The anterior horns are then the seat of an intense inflammation originating in the blood vessels.

THE GANGLION CELLS. The first changes consist in a clouding of the protoplasm by coarse granules arranged in rows around the edge of the cells and massed around the nucleus. Fine granules are sometimes seen in such great numbers as to make the nucleus invisible. The cells of the hypoglossal nucleus [case 34] were clear and transparent, with distinct nucleus. They did not stain well. Most of the dendrites were lost.

There are, of course, numerous transition forms. The average degrees of degeneration seen in the ganglion cells gave them the appearance of round, structureless refractive bodies without any trace of nucleus or of dendrites. In some sections emigrating cells, probably leucocytes, are massed in the pericellular spaces, completely surrounding the individual ganglion cells, and presenting the peculiar appearance of ameboid cells. The regressive changes vary directly with the number of leucocytes. The nerve filaments in the horns have undergone hyaline degeneration.

The lateral columns have been more severely affected than I had expected. Cross sections were stained with Weigert's hematoxylin. The degenerative process is confined to the portion containing the intermediary fibers, the association tract, going as far as the fibers of the crossed pyramidal tract but leaving them intact. It is possible that the intermediary fibers situated within the pyramidal tract were involved. It is noteworthy that Rissler found no inflammatory changes outside the anterior horns in the zona limitans lateralis. Longitudinal sections show most clearly the changes in the lateral columns. Between apparently normal nerve fibers lie the debris of degenerated fibers with the axis cylinder broken up into small sections, either twisted into spiral shape, or with both ends swollen. The myelin sheath is divided into rounded sections occupying the place where the normal nerve fibers had been. They are either empty or enclose what remains of the axicylinder.

Enlargement of the axicylinder as in acute myelitis is seen in some sections but is apparently rare. There were no signs of inflammatory changes in the glia or in the vessels; no hyperemia, no appreciable increase in the leucocytes or the nuclei.

The degeneration of the association fibers is therefore secondary. The association fibers affected go to and from the degenerated ganglion cells, and the degeneration is that always occurring in fibers cut off from their center of nutrition.

MOTOR NERVES. The anterior roots show secondary degeneration varying in intensity with that of the corresponding horn. In the sheath of Schwann are here and there seen masses of the myelin sheath without traces of axicylinders.

Is the primary seat of the inflammatory process in the nervous system, the ganglion cells or the glia substance? This question has been the subject of lively discussion, Roger and Damaschino maintaining that the degeneration of the ganglion cells is secondary, in opposition to Charcot's opinion that they are destroyed independently of inflammation in surrounding tissues.

In my opinion the inflammatory and degenerative changes keep pace with each other, but it is not therefore certain that the cell degeneration depends upon the interstitial inflammation. In fact, in some sections degenerated ganglion cells are seen without marked inflammation. Charcot is therefore right in saying that the ganglion cells are directly attacked by the virus of infantile paralysis. On the other hand one would not be justified in regarding the inflammatory changes as secondary to the degeneration of the ganglion cells.

On the whole the degeneration of the ganglion cells in the anterior horns dominates the pathological picture. The inflammatory changes in glia and blood vessels were less marked in the adult subject than in the children, but the degenerative changes were intense and extensive.

Pierre Marie thinks that the virus shows an affinity for the blood vessels. That view is not upheld by Rissler's findings. The acute process is sharply limited to the anterior horns and to portions of the nervous system closely related to the anterior horns, and Rissler found no inflammation of the zona limitans lateralis, which Pierre Marie believed to be involved during the acute stage. Rissler emphasizes, on the contrary, that even in the children the exudation was limited to the anterior horns. The blood vessels of the anterior horns are the same as those of the zona limitans lateralis. Therefore the virus has no affinity for the vascular system, but shows a predilection for certain structures of the nervous system.

The distribution of the pathological process in the nervous system is clear from what I have already said. The main pathological features seen in cross sections are: the degeneration in the anterior horns and the descending secondary degeneration of the lateral tracts parallel to the descending secondary degeneration of the anterior nerve roots.

It is of interest to note that the cells of Clarke's columns in the lower sections of the spinal cord were degenerated in case 22. Redlich [Wiener klin. Wochenschr., 1894, XVI] and Trevelyan [Brain, 1895, Summer and Autumn, p. 248] have made similar observations in the acute stage of infantile paralysis. Since we have anatomical proof that such changes occur in infantile paralysis one would be justified in considering the possibility of involvement of Clarke's columns in cases presenting symptoms of ataxia or incoordination.

In case 34 one of the posterior horns showed intense hyperemia, but microscopic examination revealed no other changes.

One could get a very good idea of distribution in the spinal cord with the naked eye, but the changes in the medulla oblongata and the pons were only visible under the microscope.

The microscopical findings correspond to the clinical symptoms. However, in case 22, the motion of the upper extremities remained unimpaired until 36 hours before death, although the lower extremities were completely paralyzed for 3 days before death. The degeneration in the cervical region of the spine was, nevertheless, as advanced as in the lumbar region. Both nuclei of the hypoglossus nerve were degenerated in this case.

In case 34, which during life presented signs of disturbed innervation of the ocular muscles, paralysis of the tongue, dysphagia, etc., the nuclei of the abducens, hypoglossus, and facial nerves were degenerated. The oculomotor were not preserved for examination. In both these cases the nuclei of the vagus were in a stage of degeneration, which accounts for the asphyxiation in these cases.

I am fully convinced by my numerous clinical observations that the cranial nerves are not infrequently paralyzed during the acute stage of infantile paralysis. A pathological anatomical cause for the paralysis is found in the degeneration of the pons and medulla. The accuracy of this observation will not be questioned by anyone who recognizes the anatomical relation between these motor ganglia and the motor ganglia of the anterior horns. The ganglia in the pons and medulla were surrounded by a less hyperemic area than the ganglia of the anterior horns, indicating that the latter are more susceptible to the virus of infantile paralysis. This, however, is only a difference in degree. The pathological process is the same, though the intensity varies.

IV. Diagnosis. The diagnosis is rarely made before the appearance of impaired motion. The symptom at the onset of infantile paralysis does not differ from those of any other acute infectious disease with exception of the marked somnolence. It is therefore of importance to test the motion of the limbs early and frequently, especially in young children. It frequently happens that infants and young children lie completely paralyzed for days without the mother being aware of it. Motion and sensibility are easily tested by lifting the extremities and pinching and pricking them in infants, and in older children by seeing if they can stand or walk. Unequal pupils, strabismus, facial paralysis, deviation of the tongue, speech disturbances and paresis of the abdominal muscles should be looked for at every visit. The grosser signs, as tremors, muscular twitching and convulsions are usually noted by the mother.

In my opinion infantile paralysis is a morbid entity, and as such is to be differentiated from the paralytic affections of childhood occurring in association with the exanthemata, diphtheria, typhoid fever, septicemia and pyemia, even though the nerve lesions resemble those of infantile paralysis. To illustrate: during the height of the infantile paralysis epidemic in September, 1895, I observed a case of polyneuritis and ataxia following typhoid fever which, needless to say, I did not consider in any way related to infantile paralysis.

After excluding secondary paralytic affections infantile paralysis must still be differentiated from the other idiopathic diseases of the nervous system, as meningitis and Landry-Kussmaul's paralysis. The latter is differentiated by the absence of the acute, febrile stage, by the progressive paralysis without degeneration reaction, and by the absence of trophic and sensory disturbances.

Whether some of the reported cases of Landry's paralysis should not be classed with cases of infantile paralysis, is a question not suitable for discussion in this paper.

Acute transverse myelitis I have never observed in children so I can exclude it from a discussion of the differential diagnosis.

Tuberculous meningitis is without difficulty differentiated but there are many delicate points in the differentiation of cerebrospinal meningitis, acute cerebral meningitis, polyneuritis, and poliencephalitis, [see cases 55 and 56.] In such cases it is wisest to reserve the diagnosis till the acute stage be passed, which hardly ever is protracted beyond eight or ten days in infantile paralysis and abruptly passes into the stage of restitution. In meningitis the febrile stage is of longer duration, and the motor disturbances are less marked and the fever does not cease so abruptly as in infantile paralysis. Doubtful cases presenting symptoms of spastic hemiplegia I would regard as poliencephalitis following infantile paralysis.

The diagnosis presents no difficulties after the febrile stage if one bears in mind the different types of the disease with their respective localizations. The history of the onset is of great importance in atypical cases.

I should like to call attention to the permanent facial and abducens paralysis which may result from infantile paralysis, as in cases 23 and 56, in which the left facial remained paralyzed, with atrophic changes in the left facial muscles, after all other paralytic symptoms had disappeared.

I have already emphasized that certain cases, and not very few, with no other paralytic syndrome than the facial paralysis are nevertheless to be classified with infantile paralysis. The isolated abducens paralysis occurs, but less frequently than the facial.

In fatal cases the peripheral paralysis and the symptoms of asphyxiation should give an inkling of the true nature of the disease, even when it has not been possible to establish the diagnosis. Since Cordier in 1888 called attention to the possibility of a fatal termination in infantile paralysis and since I published my observations in 1890, several fatal cases have been recorded.

TREATMENT. I have used the ordinary antipyretics during the acute stage, but have never found that they influenced the course of the disease in any way. In case 54 recovery was complete under the use of sodium salicylate. This was an atypical case, however. In many cases with ultimate recovery no medicinal treatment whatever was given. Narcotics are necessary in most cases to alleviate the pain, and I have resorted to morphin in many cases. Full doses of chloral hydrate by mouth or rectum, is the best means of controlling the convulsions and muscular tremors. Retention of urine is common and must be borne in mind in treating infants and small children. Laxatives and enemas are needed in most cases.

I have in some cases given potassium iodid after the acute stage, but have never obtained any effect. Nor have I ever seen any benefit from massage or electricity during the early stage, so that phase of the treatment is postponed until after the pain and tenderness have disappeared. Then, however, the treatment is pushed to the utmost. Faradic electricity is given whenever there is response to faradism, otherwise the galvanic current is used. Perseverance in the orthopedic treatment with massage gives good results even in the atrophic stage.

A FEW MINOR AILMENTS POTENTIALLY IMPORTANT.*

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"Despise not small things, either for evil or good***
A spark is a small thing, yet may kindle the world."

WHILE reaching out for the great things in medicine, as in life, we should not despise the little things; therefore, we wish to consider a few minor ailments or abnormalities, which trivial in themselves, often cause distressing symptoms, and, occasionally, far-reaching and even serious, conditions. In brief, conditions actually trivial or benign; but potentially, distressing or grave.

Some of these conditions are often not suggested to the examiner by the symptoms, and, hence, may be discovered only by routine examination, and even when apparent or discovered, are usually not considered of sufficient importance for serious consideration.

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Some of these ailments or abnormalities may not be causing symptoms; others, may be causing symptoms only reflexly, by virtue of a general nervousness, which symptoms may perpetuate, or even aggravate the nervous state and, in time, may cause organic disease.

We need only remind you of the various abnormalities of the eyes, especially such as lead to "eye strain," which frequently, in nervous individuals, cause various symptoms, especially headache and vertigo, and aggravate the general nervous state, and which require correction by the oculist before general treatment can be permanently effective.

CHRONICALLY DISEASED TONSILS, POLYPS OF NOSE AND ADENOIDS, are conditions, which occasionally lead to general systemic diseases and may contribute to the causation of such nervous conditions as Neurasthenia, Epilepsy, and Chorea.

Excision, of course, is here required before the depending condition can be successfully treated.

ELONGATED UVULA (often referred to as the soft palate) is not infrequently the cause of local irritation, resulting in disease of the throat, and, often producing such reflex symptoms as frequent clearing of the throat, dry cough, or feeling of suffocation and even asthma; occasionally, these symptoms occur only when lying on the back.

We have observed an elongated uvula to greatly aggravate the cough in consumption, which may itself have resulted from the irritation of the uvula, and to be the sole cause of cough in valvular heart disease, to which the cough quite naturally was attributed.

We have, also, observed the cure of a cough, which had been mistaken for consumption by a number of physicians over a period of seven years, by amputating a greatly elongated uvula; and, again, have seen the complete relief of paroxysmal asthma of thirty years' duration by the same means.

While prolonged treatment may relieve the local throat abnormality, permanent relief is only assured by amputation of the uvula.

DISEASES AND MALFORMATION OF THE TEETH may and do cause reflected pains, and may be a factor at least, in the causation of various nervous and mental states.

In this, it is not necessary that there be any local symptoms referred directly to the teeth.

The most frequent of these abnormal conditions of the teeth are impaction and abscess, but, these often cannot be detected except by a competent Roentgenographer—one especially experienced in making X-ray photographs of the jaws.

I have found these conditions as causative factors in facial neuralgia, but a warning is here necessary against the promiscuous pulling of teeth in this disease, as is often done.

Barclay[1] has called attention to the effects of dental irritation upon the throat, nose and ears, especially from numerous amalgam fillings, and devitalized ("pulpless") teeth.

We need only refer to the menace to health caused by absent or decayed teeth; when these conditions are discovered the correction lies with the dentist, who should have special experience along these lines.

IMPACTED CERUMEN in the external auditory canal may cause partial deafness of such slow onset as not to be recognized by the afflicted, and may cause "ringing in the ears," vertigo, feeling of fulness in the head or ears, nervousness, and exceptionally, mental depression, bordering on melancholia or a dry cough. The latter by virtue of the fact that a portion of the external auditory canal is supplied by the pneumo-gastric nerve.

A piece of hardened wax so small as to be overlooked by the casual examiner, may press upon the ear-drum and cause "ringing of the ears," or a distressing vertigo.

It requires no stretch of the imagination for one to understand how such symptoms could aggravate "nervousness" or even produce it in one of a nervous temperament.

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[1] Relation Between Diseases of the Teeth and Ears, by Robert Barclay, M. D., Dental Cosmos, May, 1894; also, Dental Irritation as a Factor in Diseases of the Ear, Nose and Throat, Dental Brief, April, May and June, 1906; in which are references to the literature.

Removal of hardened wax is usually easily accomplished by syringing with a weak solution of bicarbonate of soda in warm water, after previously softening by dropping glycerine in the ear for several successive nights, or by the cautious use of hydrogen peroxide.

Warts and Moles, though usually considered benign, not infrequently become cancerous in later life, and are frequently present in persons of a nervous temperament, and are even common symptoms of more serious diseases, notably, Acromagly. When occurring on exposed parts, such as the face and neck, in the male, they are liable to infection by being cut in shaving, and in the female especially, by the reason of their disfigurement, often aggravate an existing nervousness through self-consciousness, which occasionally leads to withdrawal from society and consequent morbidity, so that their removal becomes a necessity.

Though removal of these growths by the knife is reasonably safe, and the electric needle is effective, both are painful, unless used under an anaesthetic, and a scar usually results, so that I have used the solution of ethylate of soda, which is effective, painless and without appreciable scarring. Though to me this treatment was a heritage from my father, who used it many years ago, I find it is seldom used to-day. A drop or two of the drug should be applied with a glass rod, care being taken not to apply it to the healthy skin, which however, may be protected by a coating of a bland ointment; nor must it be applied too liberally lest it attack the deeper layers of the skin beneath, although I have never had this occur. It is well to know its action can be stopped by the application of a little chloroform. The dark scab which forms should remain as long as possible to prevent a scar. If the growth has not entirely disappeared, another application should be made.

I have occasionally found this drug fails to "take hold" of a certain type of warts, and children often refuse to permit its application; under these conditions the warts may be successfully treated by moistening them night and morning with castor oil and, preferably, covering with oiled silk.

The editor of the Surgical Clinic claims (and we take his word for it) the following prescription not only "works every time" but "withers warts while you wait":

Rx Sulphur sub.,....................drams, 5
Acid acetic concent. .. ...drams, 2½
Glycerini.......................... ounces, 2

Misce. Sig.—Apply the paste to the warts on small pieces of linen or spread with a brush at night, and wash off the next morning. Repeat until warts drop off.

Superfluous Hair on the face is, also, usually an evidence of nervousness, and, too, by its psychic effect, may be reflected adversely upon the neurasthenic or neuropathic.

It may be permanently removed by the electric needle, which however, may have to be repeated, is tedious, more or less painful, possibly some scarring and somewhat expensive, so that the patient may be given a prescription for barium sulphide, with instructions to mix it with an equal quantity of cornstarch and, after making a thin paste with water, apply it to the affected parts, and let remain from three to five minutes, with assurance that with ordinary care, the application may be repeated as often as necessary to keep the face free of this annoying disfigurement. Caution and reasonably good judgment are necessary in this treatment and it should be used upon retiring, as it reddens the skin for several hours.

Flat Feet and Weak Arches are a frequent source of discomfort, and may cause pain or aching of the feet, legs, thighs or back.

These are more common than generally believed, and often not discovered by the practitioner, because he does not examine for it, or does not recognize that the arch need not be broken to cause considerable distress and even incapacity. So frequently is this condition the cause of pain and distress, that we would advise a search for fallen or weak arches in all cases of pain below the waist where other cause cannot be definitely determined, and in all chronic cases, since it may, at any rate, be a contributing cause.

Weak arch or "flat foot" is often the cause of the so-called "growing pains" or rheumatism in children.

Many of these cases are treated for neurasthenia, rheumatism, malaria or sciatica, and I examined one case, which the patient stated had been diagnosed by a neurologist as locomotor ataxia.

Edward H. Ochsner,[2] gives the following as possible symptoms:

"In the milder cases, the patient usually complains of a sensation of fatigue, weakness and discomfort even on slight exertion, with a tired feeling, especially on the inner side of the foot or ankle, and a dull ache of the calf with or without pain in the knee, hip and lumbar region;" other symptoms occasionally found are coldness, numbness, cyanosis, increased perspiration of the feet, and pain on the plantar surface of the heel and ball of the great toe.

A diagnostic sign,[3] is the outward deflection from the perpendicular of the lower end of the tendo-Achilles, when weight is borne on the foot.

Frequently the now classic Volkman flat-foot-imprint will aid in making a diagnosis, though, as before stated, one may have a painful, weakened arch, so called "potential flat foot," without a broken arch and "flat foot."

Without considering the many possible causes of these conditions, it is evident that nervous debility is a fruitful predisposing cause which would, in turn, be perpetuated and aggravated by the distressing symptoms.

The cure of these conditions rightfully belongs to the orthopedic surgeon, since, as well said by Cooley,[4] "but a small portion of static foot disturbances are traceable to arch disturbances per se;" however, they frequently may be relieved by the use of arch supports, properly adjusted, which, however, requires judgment in the selection of the arches, and often much patience and persistence on the part of the patient. Perez B. Howard[5] advises the use of air-bulb supports.

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[2] Saint Louis Clinique, 1907.

[3] Helbing: Aus dem Gebienten der Ortho. Chir., March 27th, 1905.

[4] Journal of the Missouri State Medical Association, Dr. E. L. Cooley, January, 1916.

Ochner[6] finds that strapping the foot, ankle, and leg with adhesive strips, affords relief and is often curative.

Proper exercise to develop the muscles may contribute to a cure, especially in children.

CORNS AND BUNIONS of the feet are not to be despised in our treatment of the nervous, and here the first essential is properly fitting shoes, and here, too, is where the practitioner often meets his "Waterloo," as scarcely anyone will admit his shoes are too small, ill-fitting or ill-shapen, and will proceed to prove (?) it by demonstrating how he can "wiggle his toes." Nevertheless, it is doubtful if corns and bunions ever occur with properly fitting shoes, and in case of corns, the shoes are usually too small, which cramps the toes, the dorsal surfaces of which rub the shoe.

CORNS will usually disappear if the feet are soaked in warm water each night, well dried, and shoes properly fitted; but may be removed by painting night and morning for four or five days with a solution of salicylic acid in collodion.

BUNIONS are usually due to narrow or pointed shoes which deflect the toes, especially the great toes, toward the middle line of the foot, and when inflamed, may often be relieved by frequently painting with a mixture of equal parts of tr. aconite, tr. iodin and ether, though occasionally only surgical measures are effective.

Many conditions of the PELVIC ORGANS give rise to reflex or reflected (deflected) pain, though I have not observed the female generative organs to be as frequent a cause as many writers would lead us to believe; however, some very distressing symptoms occasionally occur.

An intermittent sciatic neuralgia of several years' duration was completely and permanently relieved by the removal of a myomatous uterus. A peculiar, and for a time, misleading feature in this case, was the complete relief from pain by a change from sedentary to an active outdoor life, such as horseback riding and mountain climbing.

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[5] Boston Medical and Surgical Journal, Sept. 16th 1915

[6] Loco citato.

The Male Generative Organs frequently cause reflex nervous symptoms, especially adherent or tight prepuce in nervous children, which often necessitates circumcision, though I am convinced that in many, if not in most, cases the conditions may be fully met by dilitation of the prepuce, if properly performed.

Certain conditions of the colon and rectum, in our experience, are frequently productive of local or referred symptoms and aggravate a general neurasthenic condition, which may have been the principal factor in their causation.

The more common condition of the rectum are fissures, ulcers, inflammation, stricture and hemorrhoids, and the disconcerting feature is that some of these may not cause any local symptoms; if so, the fact may be denied by the afflicted, which misleads the physician, unless, no other cause being found for pain in the back, especially of the sacral region or in the region of the sciatic nerves accompanied by constipation, which also may be denied, or autointoxication, the attendant insists upon a local examination of the rectum and so much of the colon as is possible to reach, which examination should be thorough and complete.

As stated, I have found rectal conditions which gave no local evidence of their presence, a frequent cause of referred and reflected pains, especially in the sacral region and in the area of the sciatic nerves, though it must be remembered that these symptoms may, also, result from displacement or disease of the sacroiliac joint.

The treatment of these conditions is so varied and specialized that it is impractical for us to even touch upon it; however, we venture the assertion that it is worthy of your serious attention.

Metropolitan Building.

THE MANAGEMENT OF CONFUSIONAL STATES WITH SPECIAL REFERENCE TO PATHOGENESIS*

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CONFUSION is a hall-mark of the effects of toxin upon the cerebrum. When very slight, special tests are required to elicit it. Interference with neuronal conductivity is the chief pathogenetic factor. The topical incidence of this is one of the determinants of the form taken by the psychosis, whether hallucinatory, disorientative, depressive, delusional or what not. Another factor is the state of the body secretions as affected by the toxins, a third factor is the patient's psychological status as determined by the capacity and the opportunity for experience.

Toxin may be exogenous, whether from living parasites or not, or endogenous, as from vascular stasis, malnutrition, exhaustion, endocrine disorders, or it may be dynamic, as when psychogenetic.

Bodily signs are usually present, such as reflex disturbances, tremor, circulatory disturbances and vegetative disorders. Headache and insomnia also almost always occur. Of the latter onirical delirium is usually a feature, it is a kind of somnambulism with partial amnesia often of mystical character. The perceptions are feeble and motor reactivities usually dull. That structural changes may occur when the cause of confusion is long maintained is manifest upon histological examination of the brain. But that these often permit of repair seems to be shown by apparently complete recoveries even after years.

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*Condensation of the paper read before the Med. Psychological Association, 1916. Published in full in International Clinics, 1916, Vol. II, and to appear in Transactions Am. Medico-Psycholog. Association.

The management of the patient consists of, firstly: the avoidance of adding the toxicosis of imperfectly elaborated protein, which is prone to occur even with a moderate diet because of cloudy swelling of hepatic cells induced by the causative toxin or by a similarly induced interference with renal elimination causing retention of nitrogenous substances. Lack of proper adjustment of the diet, especially in the matter of carbohydrates, leads to an acidosis, which further aggravates the toxic state by interfering with proteoclysis as well as with proper catabolism. The remedy for this is of course adequate ingestion of carbohydrate substance. The giving of alkalies after all has only a neutralizing effect, although it is necessary in some cases. But the assistance to metabolism of the alkaline salts, especially in the combinations naturally occurring in most fruits and many vegetables, is invaluable; so that these should be copiously added to the diet. Of course, sufficient water should be given, but the naive idea that abundance of water will either neutralize or favor excretion of toxins is untenable.

Violence, distress, or agitation should never be met by narcotics, which merely increase cerebral toxicity. These symptoms are quickly mitigated by hydrotherapy until the full effect of metabolic improvement from proper diet can show itself upon them.

Some of the cases following (from International Clinics) illustrate both the symptomatology of management of confusional states of different etiology.

Case I. The first of these illustrates a post infectious toxic state in an individual predisposed by sclerotic blood vessels, feeble heart and a lack of constitutional robustness as well as previous over-indulgence in alcohol. The toxic confusion was maintained and aggravated by the ingestion of pharmaceuticals and an excess of protein. Recovery was accomplished by means of the afore-mentioned principles after several consultants had failed to benefit the patient.

Post-Influenzal Confusion With Exhaustion.—In May, 1915, a judge, aged sixty-four, after a severe attack of influenza, remained very confused in mind, and began to develop hallucinations and delusions of a vague character. Several consultants were seen without result, and he became weaker and less clear mentally. When I examined him at his Virginia home, the patient was in a typical condition of mental confusion. Deep reflexes were very faint, abdominal reflexes were absent, there was plantar flexion. There was no paralysis and no anaesthesia, so far as could be ascertained. The optic disk was not œdematous and showed no arteriosclerosis, but the superficial vessels had thickened coats, though the heart was small, the apex reaching only to the lower border of the fourth rib, one inch inside the nipple line.

Systolic blood-pressure was 102, the diastolic 60. The kidney function had been ascertained by Dr. A. Hooe to be normal, phthalein appearing in ten minutes, to the amount of 30 per cent and 34 per cent in the first and second hour respectively. But there was a large quantity of indican and a slight trace of albumen.

The patient was taking the following diet and medication: 2 a. m., beef-juice; 3:20, ammonia; 4, red solution (potassium iodide); 5:30, grape-fruit juice; 6:15, three tablets, egg, whiskey, milk; 7:30, ten drops B. P., adrenalin solution; 8, ten drops solution iodide potassium; 10:20, soft toast, coffee; 11:15, three tablets—caffeine, strychnine, sparteine; 12, ten drops B. P., 12:30, ten drops solution; 1:30, beef-tea; 2:30, ammonia; 3:30, three tablets; 4, custard, cream; 4:30, ten drops B. P.; 4:45, ammonia; 5, ten drops solution; 7, egg, whiskey, milk.

I considered this a case of acute exhaustion psychosis, partly toxic in character. The treatment prescribed was embodied in the following report to his physician.

As the patient is suffering from exhaustion, stimulants are contra-indicated, as the tired organ is incapable of further response to them; therefore, I think it wise to omit caffeine, the secondary effects of which increase the exhaustion.

Strychnine should not be further given either, for it merely increases the discharge that is the exhaustion of energy of medullary neurones.

Sparteine is a nerve-muscle poison, the effect of which in improving cardiac activity can not be maintained for long without greater nutritional capacity than the patient possesses.

I see no advantage in the iodide of potassium. Furthermore, the basic element of this is a strong cardiac depressant. Nor should I give the bromides during the effort to build up the patient, as they diminish metabolic processes and lower resistance. Ammonia should be kept for emergencies only, as its effect is evanescent.

The regime I prescribed is as follows: 6 a. m., five grains of sodium bicarbonate in four ounces of hot water; 6:15, one orange; 6:30, breakfast, cereal and milk, one egg, crisp bacon; 8:30, massage, consisting of slow, deep pressure without friction; the purpose of this is to increase the vis a tergo of the circulation and thus aid the heart by saving its via a fronte. Sleep if possible.

On waking, about 9:30, five grains sodium bicarbonate in four ounces of water; 10 to 10:30, lunch, one banana, cereal, and milk; 12 to 12:30, massage, sleep; 2 to 2:30, dinner, meat and potatoes, green vegetables; 4:30, massage, followed by five grain sodium bicarbonate in four ounces water; 6:30, supper, unpolished rice and milk, one banana. between that and midnight, massage again when the patient is awake. For midnight lunch, graham crackers and milk are desirable. The quantity of milk at one meal should not exceed five ounces. After meals the patient should be given one capsule of "phytin," an organic phosphorus preparation of the Society of Chemical Industry of Pasle.

Beef-tea and gelatin should be omitted as containing too much excrementitious materials, which are cardiac poisons. Coffee and tea should be omitted also. A small piece of bread, with or without butter, may be taken with each meal if desired. Water should be the drink, and should be given about one hour before each meal, but should not be restricted to that time if the patient desires it at any other.

The adrenal principle should be continued, and I think it is better given as the dried gland, say three tablets a day to start with. I think that its effect might be improved by being taken along with 1 tabloid of "hormotone."

If this diet is found to be too heavy, diminish the quantities at the commencement. If the patient suffers from the heat, cool sponging should be beneficial; and in any case its effect upon the innervation of the vascular system is usually most beneficial; the water should be used lukewarm. The best cereals to give are puffed grains, with an occasional change to oatmeal and the brown prepared wheats, such as Ralston's. If the patient should desire any one article of food, let him have it occasionally.

When these measures were carried out, improvement was rapid; so that in four weeks the patient was able to be about, and the following term took his place on the bench, and remains well at this time.

Case II. A case seen with Dr. Hardin illustrates the fact that old age, weak heart and debility need not denote unfavorable outcome. (See Internat. Clinics.)

The exogenous poisons, such as alcohol, may produce a confusional condition which resembles paresis.

Case III. A case of this kind was sent by Dr. Aymer of Charleston, in 1909, because of hallucinations, delusions and violence, the result of eight days of alcoholism. The distinction was very simply made by examining the spinal fluid, so that the patient was sent home well in two weeks, even although he had shown slurring and reduplicated speech, and gross impairment of calculating power. Seven years later the patient remained well. It is true that an occasional case of paresis very rarely has as low a lymphocytosis, but never during an acute attack of the period simulated by this patient.

Case IV. The distinction was similarly made in a case due to morphine to which I was called in consequence of an alienist's diagnosis of paresis. This patient's morphinism was perhaps due to marital infelicity, for he is now remarried and five years later remains well.

Endogenous Sources of confusional states are most clearly seen in hypopituitarism as the following case shows:

Case V. Narcolepsy from Hypopituitarism.—A clear-cut example of the confusional state of pituitary insufficiency is that of the girl of twenty-five referred by Dr. John Dunlop, in 1911, to whom she had been sent on account of the pains in the back and dragging feeling and tenderness in the legs, in the belief that she had sciatica. There were absent-mindedness, severe amnesia, dull, heavy headache, which was sometimes bursting and was located deep and low in the middle of the head. Torpor would occur often suddenly, even causing her to fall. The mental confusion was most marked in these attacks, in which she felt as if intoxicated, singing and speaking absurdities. Although there was no vertigo, lines would blur when reading.

General and neurological examination was negative, except for increased reflexes, hypertrophy and tenderness of the subcutaneous fat, the weight having increased from 131 to 184 pounds in three months. The limbs were irregularly asymmetrical; for instance, the left knee measured 16 inches, and the right 17⅛; the thighs respectively, were 38½ and 38¼, and ankles 9¾ and 9 inches in circumference. The femoral veins were congested, so was the conjunctiva. A neoplasm around the pituitary was diagnosed on account of the situation of the headache, torpor, the adiposis. Confirmation was obtained by the finding of visual field contractions, and deepening of the Sella turcica, as shown by the X-ray.

The treatment of the case consisted of the exposing of the pituitary region to radiotherapy, applied from four different temporal points, about ten minutes every week.

Six months later, although the weight had not diminished the headaches had, the visual field had enlarged, the reflexes diminished, and the narcolepsy ceased. We expected to give thyroid gland[3] in order to diminish weight, but the patient passed from observation; so we do not know if her relief continues and are unable to supplement the preliminary report of the case made in January, 1912, in the Journal of the American Medical Association.

Psychic disturbances such as a powerful emotion may cause temporary confusion; but it is doubtful if this can be prolonged in the absence of secondary somatic factors, such as impaired metabolism, circulation, and internal secretions.[4]

CASE VI. The case which follows, however, was purely psychic when dealt with by me:

POST-ONIRICAL FIXED IDEAS REMOVED BY REEDUCATIVE PSYCHOTHERAPY.— A clerk, aged twenty-one, was referred by Dr. J. J. Richardson for advice and treatment on account of a state of mental confusion, impossibility of concentration on work, extreme depression of mind, and nocturnal hallucinations.

After he had given his name and address he began by saying: "Do you believe in God and Christ?" and when I asked him what was the matter he said: "It is dreadful, awful. Where am I and what is right? It seems desecration to speak of it: if you can't help me I do not want to speak of it. Everything seems blended into one thought: all else is confusion." I then asked him how the trouble had begun, and after much questioning he succeeded with difficulty in revealing to me what had transpired.

During ether narcosis he had felt that the world had reverted to nothingness, that in consequence he could not reach God and Christ, and longed for death, so that he could escape this terrible nothingness. Everything seemed blurred in that one thought, which kept recurring in spite of his prayers to God. "It seemed a curse to be brought into the world to suffer that awful mental pain; it seemed like after-death lasting a million years."

For the next week or so he had gone about suffering terribly, seeming as though he would go insane if he could not return to God. A lecture on evolution only seemed a desecration. He would wake at night having dreamed the experience again, trembling with fear of his future.

Examination showed no physical disturbances.

Therapeutics.—He was treated by a full, though concise explanation of how thought is disordered by the perversion of brain chemistry during narcosis;[1] how the feeling-tone may also be thus depressed, and how the distortion of impressions during a sad feeling-tone phase resulted in his hallucinatory concept of chaotic annihilation. It was explained that this concept was based upon morbid percepts caused by the ether, and therefore should not prevail over rational explanations of common experience and good sense. Many illustrations of toxic and mystic thought were related, and comparison drawn with his own case.[1] He was asked to write out the inferences he drew from the facts presented him; and he was referred to a clergyman for an explanation of his theological doubts. This, however, he did not receive, and I had to resume treatment without this assistance. He made a rapid recovery.[2]

CASE VII. ANXIETY CAUSING EXHAUSTION WHICH PRODUCED MENTAL CONFUSION.—A woman of thirty-five was referred by Dr. Ada Thomas because she became disturbed about some botanical investigation she had conducted successfully which she could not seem to finally formulate, although she had made a preliminary report to the satisfaction of superiors. She would keep on starting experiments, but they did not seem to go right. She felt dazed and as if everything was out of joint. The work seemed easy, and yet she could not accomplish it. As there was neither insomnia nor loss of weight, she felt that her trouble was psychological. But her reflexes were exaggerated, her hand trembled, her eyeballs were prominent, with congested lids, and the breath was very foul. However, she persisted that it was temperamental, as she had had an attack as a teacher some years before, and thinks that she was prone to it as a child. She was hyper-conscientious and had too much ambition for her strength.

Though her blood-pressure was only 128, her diet was lacking in succulence, and she had been taking extra milk, but without causing constipation. Thinking that improved metabolism might help her, I prescribed a week's vacation, with golf, a more succulent diet, and a mixture of hormones. In a few days the blood-pressure fell to 105, diastolic 55, and she "felt like doing nothing at all and without mind;" so that the golf was stopped, and she was put to bed, whereupon the blood-pressure after five days slowly rose to normal, the reflexes diminished, the tissues were firmer, but the pulse-rate mounted over 100, going to 120 sometimes, and slight exophthalmos appeared, with the sign of Moebius. There were no sweats, the breath was less foul, she felt clear mentally. Mixed hormones were stopped. She was then given secretogen and advised to return to work the next week, which she has accomplished satisfactorily since.[5]

CHRONIC CONFUSION.—That a great many cases of chronic mental alienation supposed to be idiopathic are in reality toxicogenetic is becoming clear.[9] Most significant is the autopsy material of the Massachusetts State Hospitals, in which every case of 100 carefully studied showed kidney lesions.[10]

When confusion becomes chronic, internment is usually imposed, often with a diagnosis of dementia praecox, which is regarded by Regis as merely the chronic form of the mental confusion of Chaslin. From Kraepelin's rubric, Regis[11] excludes cases of constitutional origin, usually the hebephrenics, which undergo rapid involution at puberty. The others, he maintains, begin with an acute attack of mental confusion due to toxin, usually show catatonia, and often end in dementia. Otherwise, there is a gradual failure with delusional formation inversely proportional to the rapidity of the dementia, and, finally, a permanent defect.

The recovery of some of these cases, even after long periods, is in harmony with the conception of Regis that a factor outside the cerebrum itself is at work. This is in no way antagonistic to the finding of lesions in the brain itself by Southard,[6] for we know that toxin can produce neuronal damage. A most remarkable recovery of a confusional state of 17 years' duration was recently reported by a Pennsylvania psychiatrist.

CASE VIII. I myself[12] have reported an example of recurrent maniacal confusion of toxic causation, which was completely removed when we prevented the autotoxemia of excessive eating, which at each alternate menstrual period produced an acute confusional attack, with rise of temperature, leucocytosis as high as 30,000, lasting for ten days or so, and never leaving the patient quite normal in the intervals. (N.Y. Med. Jour., Diet in Nervous Disorders, 1911.)

It is less well known, however, that an acute mental confusion sometimes occurs in consequence of secondary syphilis.[14] In this there is always found an intense congestion of the meninges, and there is consequently an abundance of lymphocytes in the cerebrospinal fluid, which is not always the case in chronic endarteritis; although even here some meningitis is the rule and the fluid shows an increase of cells.[15]

In this place I do not consider in detail the mild, recurrent chronic confusion which is often an accompaniment of, and sometimes substitute of, recurrent headache. That it is also a toxic phenomenon seems clear from a study of a considerable number of cases where (Therapeutic Gazette, May, 1917) successful management is based upon a view of their pathogenesis more precise than those hitherto set down without adequate thought by most authorities. The following is an example:

Case IX. Marked Confusion Due to Metabolic Migraine Resembling Petitmal.[7]—A bacteriologist aged thirty, was referred to the writer in the spring of 1912, by Dr. Paul Johnson, because of attacks so-called "bilious" (but not preceded or accompanied by constipation), which produce headache, preceded by numbness and prickling in the fingers, followed by dizziness, mental confusion, and foolish talk of paraphasic type, without loss of consciousness. These attacks had occurred every two or three months since the age of twenty-two; they were of very short duration; there were no scotomata, but they were formerly accompanied by vomiting. The headache was of the splitting kind, lasted all day, and was followed by dullness and slowness of thought the day following. The capacity to concentrate his thoughts was increasingly impaired even between the attacks. He was at times irritable. He had no bad habits, and, apart from these attacks, he was well and strong. He received a blow on the left side of the head as a boy, and there was still a dent in the left parietal region, upon which side the headache more often occurred. He had a large appetite, which he said he controlled, but he ate meat thrice a day, although, he said, sparingly. The blood-pressure was not raised, and reflexes and sensibility were normal.

TREATMENT AND PROGRESS.—He was given the low protein "standard" diet. He wrote the writer the following winter: "Since I have reduced the amount of protein in my diet and increased the quantity of vegetables, I have had no recurrence of those spells." Dr. Johnson informed the writer that he remained well to date, five years later.

THERAPEUTIC SUMMARY.—The treatment of confusional states should be easily gathered from the foregoing. It should not be merely empirical dietary and effort at elimination, but should ever be directed towards combating the etiological factor of the confusion. Thus, when the kidney is at fault, nitrogenous food must be diminished; so, also, when the liver[8] is disturbed. When exhaustion has occurred, nutrition must be ample. When the internal secretions are disordered, it is to these that attention must be directed.[13] When psychological factors are at work, they must be met with psychotherapy. Physiological irritability must be counteracted, not by depressants or narcotics nor by forcible restraint, but by hydrotherapy, fresh air, and non-stimulating food. Even in patients violently disturbed the death-rate where narcotics are used is much greater than when physiotherapy is employed alone.

Gregg says, in recounting their experience at the Boston Psychopathic Hospital:

"The result of the eliminative treatment of the deliria with relative freedom and hydrotherapy, and a minimum amount of medication, far excels in effectiveness the usual treatment by restraint and depressant drugs in cases of the symptomatic psychoses, including alcoholism.

"Every general hospital should be provided with the facilities for treating properly cases of delirium. Such facilities should include isolation wards where quiet is not essential, and continuous bath apparatus for hydrotherapy.

Very striking is the difference in the death-rate among 50 cases of delirium tremens in five general hospitals, comprising 50 cases from different hospitals in New York, Philadelphia, Baltimore and Boston. These were treated by depressants and showed a mortality of 26 per cent., while 50 cases from the Boston Psychopathic Hospital were without mortality, in spite of the fact that they were older and more complicated.

In the acute and grave cases measures may be required more drastic than those employed in the cases I have related. Such are: rectal irrigations, saline injections, intravenously or per rectum, but these with caution, lest chlorine retention on account of renal hypofunction, by causing oedema, aggravate cerebral incompetence, hyperhydrosis by electric-light baths or hot-packs; or even bleeding or rachiocentesis.

1705 N. Street. Author's Abstract.

REFERENCES

1. See author, "The Origin of and Craving for Supernatural Explanations," Jour. Abnor. Psychol., 1915, and Med. Record, 1916.

2. Compare the cases related in my "Prevention of Suicide," Amer. Jour. Insanity, 1914.

3. "The Syndrome of Adrenal Inadequacy," Jour. Amer. Med. Assn., Dec. 9, 1914.

4. See author's "Psychogenesis and Internal Secretions," Montl. Cyclopaed., 1911.

5. Regarding psychogenetic disease, see author's Cleveland lecture on "Treatment of Psychogenetic Disorders." See also "Spurious and Genuine Psychotherapy," Illinois Med. Jour., Oct., 1914, and Med. Press and Circ., January, 1916, and the sixth case in this article. See also "Prevention of Suicide," Amer. Jour. Insanity. "Psychogenetic Disorders in Childhood," Jour. Abnorm. Psychol., 1912; Wash. Med. Annals, 1912, Amer. Jour. Med. Sc., 1911; Post-graduate, 1912. "Treatment of Hysteria," Jour. Amer. Assn., November, 9, 1914.

6. Southard and Canavan, Mass. State Board of Insanity Reports, 1915.

7. "Treatment of Epilepsy in Accordance with Pathogenesis," Interstate Med. Jour., April, 1915; Rev. Neurol. and Psychol., March, 1915, Med. Record, 1915.

8. See de Biol. de Paris, 1903-1906.

9. Massachusetts State Hospitals Reports, 1915.

10. Massachusetts State Report, 1915.

11. Congres des Alienistes, Paris, 1904.

12. "Concerning Diet in Nervous Disorders," New York Med. Jour., 1912.

13. Endocrine Neurasthenia, Medical Record, April, 1917.

14. Author, International Clinics, 1909, Ser. 20, vol. 1.

15. See Vincent, Thèse de Paris, 1909, and author, Med. Record, Path. Prodromes of Tabes and Paresis.

16. At Detroit Session of Amer. Med. Asso., June, 1916.

NOTES ON THE HISTORY OF PSYCHIATRY. XV.*

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V. All the forms of insanity and its diatheses described in the books of Hippocrates arranged in a brief resumé.

Disposition to insanity:

1. To mania 2 degrees: [a]. men previously sane [on diet I. 352.] [b]. Wrathful and excitable.

2. To senseless and melancholia, 2 degrees: [a.] Men almost sane [ib. p. 351.] [b.] The stolid [ib.]

I. Amentia [senselessness.]

1. Amnesia with sad soul [book on Holy Disease, p. 301, Essay on Insanity, p. 1286.]

2. Imbecility [on diet, I, p. 351.]

II. Mania.

1. Mildly raving condition [nearest to mania except the disease itself, p. 352.]

2. Mania with gloomy and sad soul [book on Holy Disease and Essay on Ins., l. c.]

III. Melancholia.

1. Melancholia with sad soul, nearest to mentia, [Holy Disease and Insanity, l. c.] The abdominal variety [on Diseases II, 486.]

2. Intermittent with satiety of life [Epid., VII, 1234, i. b., V. 1160; with impulse to murder [In girls, I, 562; on place in man, p. 420.]

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*Continued from November, 1916.

3. Mel. hysterica [de mord. mul. I, 594.]
4. Mel. daemonomaniaca [de virg.]
5. Mel. panica [Epid. V., p. 1159, VII, 1233.]
6. Mel. with fixed idea [ib.]

VI. *Some remarks on Physiognomy and Semiotics.*

These natural marks of insanity are almost all taken from book II on common diseases, par. 5 and 6, which have the title "physiognomikon" and some also from the book on judging, do not belong to the genuine Hippocrates as we are convinced. For that great physician was not wont to utter such conjectures as there occur, but more those that are owed to experience.

Much of what is contained in the 2nd book on Epidemics is obscure and disconnected since they have come not from Hippocrates but from many, a fact noted by Galen. The book appears to him to have been collected from the opponents of Hippocrates without any system. A second book, in which some remarks from Bk. II, on Epidemics, interesting to us in this place, are repeated; but the work is mutilated as Grimm, rightly in my opinion, suspects. More require emendation in this than in the second book. This booklet is only patched together from the genuine writings by the later Hippocratics and lacks not only system but sometimes even sense. Far be it from me to dare to explain the obscure passages that meet us; I will offer the words as they are placed in the context in order. Whatever seems to need emendation, I will later explain in an appendix.

[1.] A stammerer or a bald man or one who stops while speaking or has a hairy body is somewhat troubled with melancholic disease. Among the aphorisms a similar one occurs: If the tongue is suddenly thrust out incontinent or any part of the body undone comes to view, that is melancholic. Aristotle desires to prove the truth of this view.

[2.] Any one whose artery beats noticeably in his elbow is prone to raving and wrath, but if it is quiet he is torpid [stupidus].

[3.] Varices [dilated veins] which appear in bald men unless they are great indicate raving in them.

[4.] Those that have a big head, little eyes, stutter and are prone to wrath.

This sentence is of great inportance for the diathesis of mania, to which the wrathful [oxythumoi=sharp spirited] can easily pass. Like this is one of the following which runs, "those who look with squinting eyes are wrathful."

[5.] The stutterers who pronounce words extravagantly are melancholics and bilious.

The word tachyglossos [=quick tongued] seems not to have been taken in its best sense here, but signifies that volubility which is found in the intoxicated. This may be inferred from the preceding word trauloi [=lisping, stuttering] the word katakorees [=immoderate] is obscure, generally meaning full, satiated, filled; then "bile" seems necessary to be supplied in many places, whence it is the same as bilious; otherwise even this passage lacks good sense. Bilious and melancholic do not mean the same thing at all. Bilious people are wont to be wrathful but melancholics rather of a slow mind.

[6.] Those that have a bilious chest, are stutterers, prone to insanity and bald.

[7.] Of those who have a distorted body from birth are hebetes [stolid] or are subject to calculus, or are insane [mainomenöi.]

Possibly rachitic?

[8.] Blood collected in the breasts foretells raving.

[9.] In melancholic diseases sudden deposits of the matter of the disease are dangerous in that direction; they herald either apoplexy, or convulsions or mania or blindness.

VIII. *On the frequency and duration of insanity and its several varieties.*

Foderé and other recent writers conjecture that insanity was much less frequent in the ancient Greek times than at present, yet I am not convinced that this is a true conjecture since the conclusions that seem to him to follow from our chain or reasoning [serie cogitationum] do not exactly seem to corroborate them. For it ought to occur to any one who has studied Hippocrates that there was in the diseases of that time an immense number of symptoms that are called nervous, for everywhere convulsions, tetanus, paralysis, defects of speech and similar affections are mentioned and almost all those suffering from fever were delirious. Indeed many of the most ancient books treat chiefly of delirium, i. e., the books on prorrhetici and prognostici. May it not be suspected therefrom that even insanity, an affection allied to delirium, was at that time more frequent, since we find even in the Greek tragedies some of the most surpassing heroes insane, e. g., Hercules, Ajax, Orestes, Athamas, Alcmacon, Bellerophon? Plato speaks of mania in many passages, i. e., a chronic affection of the soul and nousein [to be sick] is especially used of the soul. The writer of the essay "On Maidens" refers to the insanity of girls, a form of melancholia among those which he terms aeigenees [always continuing.]

That condition of mind which we call melancholia seems to have been more frequent than true mania. Although others think otherwise, still I think I have already shown this above.

Spring and autumn are mentioned as the seasons of the year that are conducive to affections of the soul. Of the spring it is said: "ton men gar eros to manika kai ta melancholika," [=for mania and melancholia belong to spring.] So the disease, which is called phrontis, is said to seize the most in spring.

Since insanity in the opinion of the ancients and among those of the Hippocratics also, was a disease which is principally caused by bile and bile was considered to be most plentiful and strong in the autumn, it should follow, that mania also among the bilious diseases should be mentioned in the autumn. So accordingly Hippocrates in the aphorisms teaches: "In the autumn in addition to the summer diseases others also attack men, among them mania and melancholia."

CHAPTER IX.

ON THE ORIGIN OF INSANITY.

I. *On the remote causes in general.*

What is handed down in our books about the disposition to insanity is only theoretical and it does not concern us therefore in this place to signify what was known to the Hippocratics about the true origin of insanity. We need to mention at least one point that atrabilious persons used to be considered more subject than others to insanity, not merely to melancholia proper, but even to mania. Everything that was believed to arouse the atrabilious humor should, according to their opinion, favor the rise of insanity even among all other melancholic diseases. And yet I do not think it is my duty to enumerate all these hypothetical causes that occur, but I should like to mention that which they relate about the use of beef, that by that means the melancholic affections grow worse because the nature of those affections can not overcome it. [In this connection Galen places cheese next to beef.] Almost nothing is said about the occasional causes, and it is not clear whether the conditions [from which as is shown by examples insanity can arise] are occasional causes or diseases preceding insanity, since in general the origin of insanity is mentioned by few. Only once are manias of occasional causes mentioned as where mildly raving persons are described who, we are told, became deranged [furere] from the use of wine or meat and in general from good conditions of the body.

II. *On the origin of insanity from diseases of the body.*

A greater part of the passages, in which the Hippocratics have left us something about the different origins of insanity, mention diseases of the body from which insanity springs. For an unaccompanied [mera] mental affection arising without external cause, and passing into insanity does not occur. It could not have been the opinion of the Hippocratics, whose knowledge after removing the errors of superstition and for the most part ignorance, was better than the Greeks of an earlier time, and to whom it was impiety and sin to produce [procreare] insanity. Let us now review what we have been told about insanity springing from affections of the body.

1. Insanity following fever.

Examples of the derangement which follows fever meet us very frequently, but since alienation of the mind is very often mentioned in the same words, as we have heard, as what is in fever and what comes without fever, just as with the word paranoia, since the Greeks had no other word than mania for the derangement which every febrile delirium brings, we can but be in doubt frequently about the mental alienation springing from fever, if the author is silent on the continuance of the fever, as to whether it is to be considered chronic or not.

At this point I may produce but two examples in which the marks are present which seem rather to suggest than to dissuade that we understand chronic insanity.

[a] The genuine Hippocrates writes that he has observed a fever in which to older people and those lacking warmth mania [manika] was apt to come in addition to a paralysis of the members [resolutionem] partium [paraplegia] and blindness. Since paraplegia and blindness are generally chronic affections, raving also can be considered chronic in this passage. In other respects this passage corresponds to Aph. VI, 56, especially since, on the authority of Galen, as has been found in one codex, you add after manika, he melancholika.

[b] "Fevers in which the mind is already disturbed, in anoi; bilious distress of the mouth of the ventricle are broken by insanity [ta manika]." But we have not found out from that aphorism of the paranoia whether the raving continues or not. Therefore the passage is again doubtful.

All the passages are about of this kind so that we can get little from them for our purpose. So also in the following passage which is, however, worth quoting; for although the statements probably hold good only for delirium that it happens in fever as result of a retarded crisis, surely we are forced to conclude that insanity coming after fever was considered by the Hippocraties as a mark of retarded crisis. The passage to which I refer is as follows: Those whose ears have become deaf and are not relieved of fever which happens if there is epistaxis, bilious diarrhoea, dysentery or pain in the hips or knees, must rave.

2. Insanity from epilepsy.

[a] Melancholia. "Those suffering with an epileptic disease are wont to become melancholic." That we are not to understand here under melancholics as a whole those

troubled with black bile, as some have wrongly supposed, but those mentally affected, is shown by the words of the context. For then, if disease seizes the mind, epileptics become melancholics. It is known, moreover, that generally in an atrabilious disease the soul is not troubled, but in melancholia when specifically so called. It is not evident from those words whether epilepsy is cured after this change of form [metaschematismus] or lasts longer. Mania is said to cure it; but melancholia is clearly stated not in the least to lead to ecstasy in epileptics who are badly affected mentally or who have become apoplectic, although with other epileptics as the gar [=for] in that passage shows it is wont to be an advantage.

[b] Mania. "Raving, by its habit of attacking, cures the great disease [i. e., epilepsy]." Whether the manie in this passage is chronic or febrile raving, is impossible to define, surely because this declaration is consistent, neither with what precedes, nor with what follows. But if any one says that this sentence taken from the book on judgments, as the whole book is compiled and collated from the others, is a repetition of those words which have been said about melancholia [for manie in this passage is used for a generic term for insanity;] I have only this to reply, that epilepsy to be sure passes into melancholia, as we have just heard, but it does not therefrom follow that it is relieved by it; and so the sense of this declaration is more restricted. Furthermore, physicians are not unacquainted with cases of mania by which epilepsy is removed. There will be opportunity to consider more carefully in appendix III whether this view meets us a second time in the Hippocratic writings.

3. Insanity from convulsions.

As far as the meaning of the word extends to these the following have been said: "When a man is found with distorted feet and hands, he is bringing insanity on himself." Foesius notes on the words hopotan anthropos [=whenever a man]: That seems to be understood about convulsions, as is written in the booklet [peri krisionon=crisis] although it seems doubtfully' genuine, and it is uncertain whether he applies cauterizing [inustio] the veins as a cure for it as some codices and translators suppose.

The expression couto poieei manien [=he makes mania for himself] I confess I do not understand, but I think it is not at all contrary to experience that a man suffers in mind after having gone through violent convulsions, as is indicated by that declaration.

4. From irregular menses.

[a] Daemonomania and impulse to murder arises in girls at the sinking [descensus] of the menses, when the blood is retained in the uterus, and no way is given for its escape. The old Hippocraties used to suppose that the blood which lacked the means of flowing out, however copiously it flowed, returned on account of its copiousness to the heart and transverse septum. When these parts have been filled the heart is benumbed and from the torpor arising therefrom, insanity [paranoia] attacks girls. Therefore when the secondary function of the heart is repressed insanity is caused in girls by a plethora of the uterus.

[b] A depression of the soul is wont to follow bilious menses, and thereupon freakishness in diet, anxiety, insomnia and other symptoms of melancholia, which we have just reviewed above.

5. From blood collected in the breast.

I do not venture to explain how this cause of mania is to be understood, whether irregular menses cause it, or inflammation of the breast is to be understood by the words systrophe tou haimatos=collection [or condensation] of the blood.] But in two passages mention is made of this remarkable cause of insanity. One is in too generic terms, to apply to women exclusively, but since it should rather be considered diagnostic, we have mentioned it in Chap. VII, 6, above, so here we may pass it by. The other occurs among the sphorisms: "For in whatever women blood is collected into the breasts raving [manie] is indicated." What we read in the book on Epidemics II is nothing but this aphorism, though changed as indeed might be expected from the origin of this book.

6. Alienation of mind from a return of lumbago.

"Persons who have recurrent pains of the loins passing to the head and hands, and who are affected with torpor, feel pain in the mouth of the stomach and abound in thin and serous humors, have a profuse flow of blood. But the bowels are emptied in such persons with a mental disturbance.

Brendelius thinks that in this passage hypochondriacs are understood, who are frequently affected with spastic headache, whence arise insomnia and worry [perturbatio animi].

7. Mania from very severe pain in the lower parts.

Thus we are to understand a declaration from Book II, Epidemics, unless we are forced to consider it mutilated. We shall have something to say on this subject in Appendix No. II.

III. *On the origin of insanity from the effect* [*vis*] *of external things.*

1. Insanity [mania?] from the use of mandragora root.

Two remedies, which on account of their curative power in insanity, are mentioned by the Greeks, even as we are told in the Hippocratic books, are capable of producing mania if a greater dose than is right is given. Twice where drinking mandragora root is recommended it is added, "but on a dose too small to cause raving" [elasson he hos mainesthai=smaller than to rave.]

2. Insanity [mania?] from the use of hellebore root.

After Democritus had proved to Hippocrates who had been called to cure him, that he was of sound mind, in a conversation he had with him, he said: "If you had given me hellebore as to an insane person, insanity would have followed sanity [prudentia] and they would have blamed your art as the cause of insanity. For hellebore shown to sane persons clouds their intellect [episkotei dianoian=clouds the intellect.]"

Even if these words do not come from the lips of the Hippocratics, still it is evident at least that this effect of hellebore was familiar to them, but if all the epistles are spurious, and Democritus did not himself really say this, nothing prevents this opinion being all the more surely that of the later Hippocratics at any rate, even if not of the earlier.

3. State of the intellect from use of wine.

It seems entirely unknown to the ancients that a continuous insanity can arise from the abuse of wine, and yet the Hippocratics picture us the state of the drunken as that of men raving. On the effect of wine the author of the book on flatulence says: "Through drunkenness, the functions of the soul and its intellect are broken down [concident] [metapeptoui hai psychai kai ta en tesi psychesi phronemata= collapse the souls and the thoughts in the souls.]

4. Mental stupor from too frequent use of "heat." "Heat," Hippocrates tells us in the aphorisms, "for those who too often expose themselves to it brings these ills: weakening of the flesh, impotence of nerves, mental stupor [gnomes narkosin=numbing of the mind, etc.]" It follows from the cause of the disease that the mental stupor is chronic: for a cause of this kind continuing long produces an equal affection, nor do weakening of the flesh and impotence of the nerves quickly pass away.

5. Mania arising from the treatment of haimorrhoids.

In book IV, Epidemics, the story is told of Alcippus, who accustomed to pass blood on account of varices in his anus, was freed from them by treatment; but when that was accomplished he was seized with insanity [emane=he had mania.]

IV. *On insanity springing from affections of the soul.*

The only other affection of the soul we can produce as mentioned by Hippocrates as a cause of insanity is fear. Furthermore, it can be doubted whether in the passages recently edited it can really be called a cause of insanity. But nothing prevents us from carefully weighing the passages which have seemed to others to look as if they did.

[1.] We have already spoken of the diseases of girls who see demons hostile to them and who desire to commit suicide. About these girls and all other persons thus troubled we are informed: "They are so terrified by bugbears that they lose their senses." But taking account of the disease as a whole, the etiology of which we shall have occasion to consider later, the fact of being terrified by bugbears seems to us to be the beginning of insanity and not at all its cause, both of which are wont to be confused, while the beginning of insanity is considered its cause. In girls and women this is without doubt to be looked for in the affection of the uterus and heart.

[2.] There is still another passage which we must lay before the reader: "Hoisi phobon meta katapsyxis existantai, pyretoi meth' hidroton kai hypnoi panandai tanta lyousin." In the edition of Foesius this passage is translated: "Those who have a violent mental disturbance from a disturbance with a violent cold, etc." The editor then adds in a note: This sentence is intentionally obscured by unusual and affected diction. Another translator, Duretus, thus renders it: Those who go from an empty fear caused by fever issue in raving. Katapsyxis seems to him the same as apyrexia [absence of fever] and from the passing of the fear he seems to be driven into raving. I hardly believe that katapsyxis can be taken in this sense, although it does signify the extinction of heat, for heat can be lacking without fever ceasing. Brencelius refers this expression to the melancholic class, which phobos [fear] seems to indicate to him, for before a paroxysm of torpor and raving such invalids are frightened. When we have compared these various interpretations of the passage it is evident that neither chronic raving is to be understood, nor is phobos [fear] to be considered a cause of ecstasy. Yet the opinion of Duretus, a man celebrated for his knowledge of Hippocrates, is worthy of being adverted to in these few words.

CHAPTER X.

OPINIONS OF THE HIPPOCRATICS ON THE CAUSES FROM WHICH THEY THOUGHT INSANIA SPRANG.

We could not help touching very lightly before now upon the theories of the Hippocratics handed down to us about the internal causes of insanity; for here finally consideration of them will be more careful. And it is not necessary that we should again mention the passages from which it appears that a bodily affection is everywhere considered primary by the Hippocratics and that to them insanity seemed to arise only from a mind affected by [or from] the body. We now remind the reader of those things that we have already set forth about that matter. But the theories about the genesis of insanity taken from the many spurious books, since they are not at all consistent with each other and almost mutually contradict each other, can hardly be marshalled in a systematic manner.

The Hippocratics and chiefly the man who wrote the book on humors, thought that almost all the diseases were to be derived from the corruption and excess of the humors and the airs [flatus.] Humors are corrupted by the air, water and aliments, they go beyond their bounds on account of attraction, they overflow [redundant] from one cause or another, if there is a large supply of them, or too little movement. Nor does any one of all the humors overcome the black bile, because a greater share is attributed to it in calling forth diseases; for many diseases were considered to have sprung from its fault and chiefly its pungency [acrimonia] both acute and chronic diseases, but more rarely the latter than the former. We should be unwilling to explain how the atrabilious moisture is produced, for since the matter has been handled in the single book on Humors and Lorry has expounded its origin and effect according to the ideas of the Hippocratics, we have considered we should refrain. The blood, joined with some part of this humor, is the more important in the affections of the soul.

It will be worth while, although several points have brought forth in this relation, to show in its integrity the whole passage which chiefly bears upon this topic. First "of all" says the author of the book on "airs," "I infer from those which are in the body, that nothing contributes more to the intelligence than blood. But when it continues in proper [consistente] condition, sagacity [prudentia] also lasts [constat.] But when the blood is changed, the intelligence deteriorates [concidit] also at the same time. There are many proofs that this is the case: First of all sleep which is common to all living things corroborates these statements. For when it has seized the body, the blood becomes cold; since sleep by its own nature is wont to cool. And when the blood is thoroughly cooled its circulation [transitus] is slower. That is indeed clear because bodies are caused to lean [inclinantur] by their own weight, since all heavy things are by nature wont to be carried down, eyes are closed and intelligence is changed, even strange [alienae] ideas remain longer and they are called dreams. When the blood is suddenly increased again through drunkenness, the functions of the soul and the intellect deteriorates [concidit] and forgetting present evils they conceive the highest hopes of future good. I can mention many other things of this kind in which the changes of the blood change the intelligence. Generally, therefore, when the blood has been changed, the intelligence is at once ruined [deperit]." But not only the blood when corrupted but also any humor changed in pungency, when it seized the brain was considered a cause of insanity. The brain is therefore the organ from which insanity originates, but the bile and all other humors are only responsible for its function being disturbed. So at the beginning of the essay on insanity, "A man goes insane on account of the humidity of the brain, in which are the activities [officia] of the soul, and if the brain is too moist for its nature it must be moved, etc. A man is sane at that time when his brain is quiet." The same statement is made in the book on the Holy Disease: "And all these [i. e., general phenomena of mental alienations] come to us from the brain, since it is not at all well, but too warm in its nature or too cold or too moist or too dry, or it feels any other affection not according to its nature and habit. And insanity comes to us from moisture. For when it is too moist in its nature it is necessary for it to act and when the affection is stirred up [movetur] it is necessary that neither vision nor hearing be at rest but to see and hear something the while, and for the tongue to utter the same things that it sees and hears moment by moment. The minute that the brain is at rest, even then a man is sane [sapit]." Galen, while commenting on this passage, rightly warns us that Plato has expressed the same opinion in the Timaeus: "Moisture is the seat of dementia, and dryness of intelligence." Now, although it seems to follow from the passages just mentioned that each humor, if it moves the brain, produces insanity, yet in another place two principal humors are named which produce continuous [to follow the phraseology] insanity. These are the phlegm and the bile, from which, after the blood is corrupted by them, are derived two different kinds of insanity, which we already know. While the bile becomes hot, the brain is changed, and because of that the blood in the veins boils, since the bile rushes in through the veins that are full of blood, from the body to the brain. Then arises an attack of raving which ceases when the blood is turned back into the veins. From the phlegm the brain becomes very cold and is more than usually contracted. Nor is that the only ill for which the bile is blamed, rendering men aphronas [=demented] but as the ancients imagined that air reached the brain and its ventricles, coming through the arteries, where the brain might receive the force of life, so that it could furnish intelligence and movement to the limbs, by the phlegm excluding the air from the arteries, failure of voice and loss of mind was produced, as took place in the Holy Disease. The Hippocratics believed that the melancholics were insane from phlegm at the same time with bile, but phrenetics only from bile, as the author of Book I on Diseases says. Their insanity is the milder the more the bile is overcome by phlegm. For bile was considered the cause of raving insanity. I am not able to understand, however, how bile and phlegm can be said, in the same place to be the causes of insanity, when black bile masters their body [unless bile is mentioned here in place of black bile] for the latter, as I have just now said, by siezing the brain alienates the mind in melancholics. And not only in the spurious books is this opinion voiced but in the genuine books also; for I think that Aphorism IV, 9, is to be understood in this way, in which it is recommended to loosen the bowels of melancholics, and it is noted: to auto logismo t' enantia prostithentes [=setting up against the same account its opposites], i. e., inasmuch as bile flows against the brain, by relaxing it, it should drive the stools [alvum] downwards so that the brain might be freed from it. In the later Hippocratics there are some statements that explain the force of the bile. But truly I do not venture to distinguish whether "he melaina chole" [=the black bile], which is often mentioned, or "he xanthe chole" [=the yellow bile], which is seldom mentioned, is to be understood by it, or finally bile including both forms. Yet not only with the Hippocratics but also with all ancient physicians, bile is of the greatest importance; not to mention Galen. Democritus tells Hippocrates that he has written an essay investigating the nature and seat of the bile which, when it overflows, is the chief cause of insanity. The latter immediately agreed, as is told in the Epistles. And not less in deliria [even the most violent] bile seemed to the Hippocratics to be the cause of mental alienation, a fact that the customary epithet of ecstasy, melancholia, well shows. So also, bile is indicated as the cause of that important insanity which, as it is intermittent and half way between febrile and chronic, especially attacks travelers. They believed that the bile caused all such, if only the brain were seized by it; but also, as we have heard, "those whose chest is bilious, are prone to rave [furibundus.]"

Besides this humoral, so to speak, pathology, from which the origin of insanity is explained in the Hippocratic books still another theory, very different from it, is found which seeks the cause of insanity in the balance of fire and water. In proportion as one or the other prevails, either raving or imbecility of the soul arises. We have already described the phenomena of these kinds [of insanity.] The author of this hypothesis has not explained how he has planned this balance for himself. The treatment prescribed for persons suffering from a bad balance of this kind that they imagined it was bodily.

Just as this theory differs from those that are wont to be adopted about the bile, so also does that example of etiology which is proposed about the diseases of girls who are troubled with daimonomania and an impulse to suicide. Nor is it an unlikely on [malae notae], indeed it surpasses all the others in truth. Wherefore let us transcribe this exposition of the cause of insanity verbatim: "The blood is contained in the uterus, as something that ought to flow out. Since then an outlet is not given the blood flows in more copiously because of the food and growth of the body, the blood lacking an outflow returns, on account of its increased quantity to the heart and the transverse septum. And when they are clogged, the heart becomes numb, and from that cause torpor, and from torpor, insanity springs. Just as if anyone sits too long the blood pushed down brings torpor from the hips and the thighs to the shins and the feet, as a result of which the feet are rendered incapable of walking. When the heart and the transverse septum are clogged, horror and fever rush in, etc." Therefore the heart is affected by the plethora of the uterus, because clogged by the blood it becomes numb, and finally paranoia springs from the torpor of this organ. As for the other several forms of insanity, such a pathogenic explanation is not found in the description of them.

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(To be Continued.)

THE TREATMENT OF GOITRE.

From a Surgical Viewpoint.

By Walter R. Hewitt, M. D.,
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GOITRES in the main may be divided into several classes, for instance: (1.) Exophthalmic Goitre ,or Toxic Goitre; (2.) Simple Goitre, as is seen in the Diffuse Type, with its sub-divisions; (3.) Slight Enlargements.

Exophthalmic Goitre has given the best results under the wise use of the knife and should be the only treatment considered.

Partial Thyroidectomy—Lobectomy is a well established surgical procedure and yields the best results.

In some very toxic cases a preliminary ligation of one or both thyroid arteries will bring about a marked amelioration of symptoms, later permitting the removal of part of the gland.

In the same class of cases boiling water injections and high frequency treatments have been used; but why substitute the uncertain for the sure? Advise early operation and thereby avoid endangering your patient's life, or else damaging the heart by allowing a "Goitre Heart" to develop.

Cases coming to the surgeon late, with marked tachycardia, palpitation, irregular pulse and distinct murmur over the praecordium, even transmitted to the axilla, and with an accentuated second pulmonic sound, may easily lead one to consider organic heart disease, when dyspnoea is marked and typical "sleep starts" are present. In these cases an absence of an etiologic factor will usually decide the issue.

In this class of cases prompt removal of a lobe of the gland usually quickly corrects the heart syndrome—the duration and degree of toxicity determining the improvement. Do not expect too much from cases that have been hopelessly damaged—remember "watchful waiting" is damaging, yea, even deadly, to your patient's heart.

Electric currents used for any length of time tend to cook the gland and give rise to a rather bloodless scar tissue, increase the hazard of operation for the patient, particularly if the goitre is intra-thoracic and adherent by scar tissue to the pleura, a fact I encountered in several cases, as well as rendering the operation technically more difficult.

Boiling water injections have been reported as offering good results but should be regarded as inferior and as an uncertain surgical procedure. They may be of value in getting the patient in shape for lobectomy, but I have a frank preference for the rest treatment and ligation.

(2.) Large Diffuse Goitres.—In goitres of this type bilateral resection is the best procedure, as Pool ("Resection of the Thyroid," Journal Surgery, Gyn. & Obs., Feb., 1917) has so well summarized in the following: "It relieves pressure, minimizes danger to parathyroids and recurrent laryngeal nerve, provides a sufficiency of thyroid tissues, and ensures symmetry."

In this class of cases removal of only one lobe usually fails to relieve the pressure and the neck is made quite asymmetrical, an unpardonable error, if the patient is a young woman.

In the nodular type a lobectomy may be all that is necessary.

In the remaining class of cases everything from drugs to cytotoxic serum have been tried and good results have been claimed. Personally, I have never had any such luck, though on one occasion I saw a moderate goitre subside without any treatment. Was it a mere coincidence or the result of rest?

Summarizing, let us look the question in the face: Given a member of your family, suffering from a goitre, what line of treatment will you follow?

Briefly, one should be expected to follow a safe, wise, certain procedure to effect a definite improvement or cure, ever remembering that exophthalmic goitre and diffuse simple goitre present no time so favorable for a "cure" as the time when they reach the surgeon early in the course of their disease.

Particularly is this true in regard to exophthalmic goitre—toxic goitre, and the safest method is surgical procedure, eventually leading to partial thyroidectomy, under local or general anesthesia, where 85% (Kocher) of recoveries may be expected.

Remember that bed rest, ice cap to the praecordium, bromides, atropine, strophanthus and a host of others should be but means for "conditioning" the patient, and if properly "conditioned" and in good shape, when reaching the surgeon, a good result should be anticipated.

Toxic goitre cases of long standing usually demand careful regulation of their many acts for some time after the operation and should not be turned loose immediately following operation, for a readjustment in the circulation and a return to normal requires time.

I am convinced that while many patients feel perfectly well following operation, a wise supervision later is of value and aids the surgical cure.

Remember that in the use of the knife early in goitre we play a small surgical risk against a great pathologic risk; one where the margin of danger is reduced to a minimum, yet even the ambidextrous surgeon takes the gambler's chance. What are you doing to lower the odds? Are you a leaner or will you aid in reducing the odds to that of a simple appendectomy by urging early operation, and before irreparable damage has been done?

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HYSTERIA AND ACCIDENT COMPENSATION.*

Nature of Hysteria and the Lesson of the Post-Litigation Results.

By Francis X. Dercum, M. D., Ph. D.,

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Preliminary Considerations.

LET us consider briefly the injuries which form the basis of compensation or indemnity, the nature of these injuries and the degree and duration of the impairment to which they give rise. It will be readily seen that they roughly separate themselves into two groups. In the first group are cases in which the injury is physical or surgical and in which both the nature and the degree of the injury is usually quite evident; as in the loss of a limb, a fracture, sprain or dislocation, or in physical injury of some special structure. In the second group are cases in which no physical injuries or physical injuries relatively slight and inconsequental are present, such as an abrasion, bruise or contusion, but in which there subsequently arise a train of symptoms nervous or mental in character. The first group of cases we may dismiss from our consideration, for the physical fact of injury can as a rule be readily determined, and, concerning it, physicians differ from each other, if at all, mainly as to the degree of the injury.

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The cases of the second group, however, demand a detailed consideration. Our knowledge of them has been of gradual evolution. It was early recognized by surgeons that nervous symptoms not infrequently appeared in persons who had been in railway accidents, but in whom no obvious physical injury existed. Such cases were early described as suffering from "railway spine." Erichsen, who wrote upon this subject in 1866, 1875 and later, made use of the term "concussion of the spine." He defines this phrase as "adopted by surgeons to indicate a certain state of the spinal cord occasioned by external violence; a state that is independent of, and usually, but not necessarily, uncomplicated by any obvious lesion of the vertebral column, such as its fracture or dislocation,—a condition that is supposed to depend upon a shake or jar received by the cord, in consequence of which its intimate organic structure may be more or less deranged, and by which its functions are certainly greatly disturbed, so that various symptoms indicative of loss or modification of innervation are immediately or remotely induced.

"The primary effects of these concussions or commotions of the spinal cord are probably due to molecular changes in it structure. The secondary are mostly of an inflammatory character, or are dependent on retrogressive organic changes, such as softening, etc., consequent on interference with its nutrition." Erichsen looked upon the symptoms present in these cases as due to a chronic inflammation of the spinal marrow and its membranes, a meningomyelitis, and, secondarily, to an inflammation of the membranes at the base of the brain. Leyden and Erb, writing at about the same period, adopted similar views. Westphal assumed the existence of multiple foci of disease in the cord and brain. Rigler, a railway surgeon of Berlin, writing in 1879, adhered closely to the pathological theories of Erichsen, maintaining however, that an anatomical lesion of the cord can only occur in collisions and only in such persons whose back is turned in the direction of the collision.

No evidence was forthcoming from actual observations of the existence of the lesions claimed; namely, inflammation of membranes or structural changes in the substance of the cord or brain. Owing to the fact that death did not take place—a fact the significance of which was not at the time realized—cases did not come to autopsy; so that an opportunity for verifying the supposed pathological changes did not occur. However, in two instances in which the patients died of intercurrent affections, one of aneurism and the other of acute alcoholism, and which did come to autopsy, a careful microscopical study of the brain and spinal marrow by the writer failed to reveal any lesions whatever (1895). Moeli had in 1887 already recognized the fact that the symptoms presented were mental in their nature and he laid stress upon fright, fear and excitement as causative factors. The psychic or hysteric nature of the symptoms was also pointed out by Wilks, Walton and Putnam. Thomsen and Oppenheim, while making similar studies, did not accede altogether to the hysteric interpretation of the symptoms, but made reservations as to a partial existence of organic lesions. It remained for Charcot to show that these cases have no anatomical basis whatever and that they are entirely functional in nature. Charcot maintained that the symptoms presented by the patients are exactly the same as can be produced by a hypnotic suggestion, and this naturally directed attention to the role played by fright, fear and anxiety. Indeed Charcot declared the symptoms to be the result of autosuggestion, and further that the symptoms described by Oppenheim, Thomsen, the American and other observers, were all due to hysteria and nothing but hysteria. Oppenheim subsequently admitted the purely functional nature of the symptoms though he regarded the clinical picture as differing from ordinary hysteria in the uniform mental depression present. Charcot on the other hand pointed out that just this mental state is typical in male hysteria.

Page, writing in England, in 1883, upon injuries of the brain and spinal cord and, later, on railway injuries, 1891, the fundamental fact of the functional character of the cases in question has steadily won acceptance by the medical profession. It is a significant fact that the terms "spinal concussion" and "railway spine," once the vogue in Great Britain, widely accepted on the continent of Europe and in universal use in this country, have disappeared from our courts for almost thirty years. Oppenheim substituted clearly recognized the non-organic, non-structural character of the cases under discussion and pointed out the importance and significance of psychic factors in the production of the symptoms. Oppenheim, to whom credit almost equal to that of Charcot is due, presented the subject in 1889 so clearly and in so convincing a manner that for these terms the expression "traumatic neurosis." Unfortunately the word neurosis, vague and indefinite in meaning, failed utterly to convey any conception as to the nature of the condition present. Notwithstanding, the expression "traumatic neurosis" repidly became the vogue and was adopted by physicians in their testimony before the courts the world over. Soon, however,. the hysterical nature of the symptoms became more and more evident and the expression "traumatic hysteria" came to be used. For a long time the profession were inclined to hedge, with Oppenheim, as to the purely hysterical character of the symptoms and such terms as "traumatic neurasthenia" and hybrid expressions as "traumatic hystero-neurasthenia" came to be employed, but they finally definitely gave way with our increasing knowledge to the name "traumatic hysteria," and thus medical men gradually came to adopt a position which one of them, Charcot, had anticipated for more than a quarter of a century.

The Nature of Hysteria.

Evidently it becomes important to study hysteria and to acquire correct ideas as to its nature. What is hysteria? Many lay persons have met with it, have seen its manifestations, have seen an attack of hysterical crying, or have seen some one—most commonly a woman—in a hysterical attack. Persons witnessing such an attack are usually greatly impressed by the fact that the patient, screaming, struggling and convulsed, soon comes to herself, re-arranges her dishevelled clothing, moves and walks about, and shows by her actions and conversation that she knew everything that was going on during the attack. Naturally the bystander forms the conclusion that, despite the noise and excitement, there was "nothing the matter after all." Let us see how much of truth there is in this conclusion.

The ancients thought that during a hysterical attack the womb or uterus becomes detached from its moorings and goes wandering about the body seeking sexual satisfaction. This theory which finds expression in the writings of Hippocrates, Celsus and Galen, has served to fasten the name hysteria, derived from ὑστέρα (hysteria), the Greek word for womb, upon the affection. Although the primitive theory of the wandering uterus has been abandoned since the days of Galen, ideas as to the sexual origin of hysteria have persisted, though of course in modified forms, up to our own day. Unsatisfied passion, repressed sexual desire, unrequited love, genital irritation and, lastly, repressed memories of sexual transgressions and peccadilloes in childhood—advocated by the so-called psychoanalytic school—have in turn served to befog the subject, to surround it with a veil of mystery and to lend it a prurient interest. However, from the days of Sydenham to those of Charcot, it became increasingly evident that the symptoms of hysteria were nervous or mental in origin, and, further, that they bear no relation to the sexual organs. Thus, operations upon the sexual organs of women, such as removal of the ovaries or uterus leave the hysteria uninfluenced; and, it has been known for a long time also that hysteria occurs in men as well as in women.

The truth in regard to the symptoms of hysteria was arrived at by their clinical study; and here Charcot and his pupils, among whom must be especially mentioned Giles de la Tourette and later Babinski, led the way. This truth is well illustrated by the following facts. A symptom frequently noted in persons presenting hysteria is a loss of feeling or sensation—a so-called anaesthesia—in a limb or in some portion of the body. Quite commonly the loss of sensation embraces an area covering a hand and part of an arm like a glove, or a foot and a leg like a sock or stocking. Now, we have learned from our knowledge of anatomy, that a lesion or break in any of the nerves supplying the limbs could not by any possibility give rise to a loss of feeling involving such an area. Such a sensory loss is totally at variance with the anatomical facts of nerve distribution and supply. A lesion of the ulnar nerve of the forearm, for instance, would give rise to a loss of sensation involving the little finger and the outer half of the ring finger and of corresponding areas of the hand and forearm. Similar definite facts obtain in regard to lesions of the other nerves of the arm, and in addition, there are associated facts of palsy and wasting of special muscles and gross disturbances of nutrition which make each picture of actual organic nerve lesion characteristic; not by any possibility, let me repeat, could a glove-like or stocking-like loss of sensation be brought about. Further, the same is true of lesions of the spinal cord. Losses of sensation in a limb due to a lesion of the spinal cord assume the direction of stripes running up and down the length of the limb, each stripe, so to speak, being definitely related to certain levels of the cord. Therefore, a glove-like loss of sensation in a hand or arm cannot be due to any lesion or disturbance of the spinal cord. If we attempt to correlate a glove-like anaethesia with a lesion of the brain, we find ourselves equally at fault. A lesion of the tract of fibres which conveys sensory impressions to the cortex of the brain gives rise to a loss of sensation involving one half of the body and the arm and leg of the same side; never to a glove-like sensory loss. The same is true when the lesion involves portions of the surface of the brain; in such case the person may, with sensation well preserved, be unable in given instances to recognize by touch familiar objects; but never is there present a glove-like sensory loss. Only one inference from the facts is possible, and that is, that a glove-like sensory loss is mental, not physical. The same fact is true of all the other phenomena presented by hysteria; all are equally mental in origin.

The next step in the interpretation of the symptoms was the recognition of the fact that they owe their origin to suggestion. Though this was known to Charcot, it is due to Babinski that the fact of the origin of symptoms in suggestion has been especially emphasized. To show the rôle of suggestion, Babinski's experience in regard to sensory losses is exceedingly interesting and instructive. In many cases of hysteria, a loss of sensation covering one-half of the body with its arm and leg, a hemianaesthesia, is noted. Babinski in testing one hundred consecutive cases of hysteria, not previously examined by physicians, for hemianaesthesia, and, being careful to avoid making any suggestion, failed to elicit the symptom in a single case. Again, the hemianaesthesia is usually found upon the left half of the body. Babinski points out that the physician being usually right-handed, has the camel's hair brush, pin or other instrument in his right hand and, facing his patient, naturally tests the left side of the patient first, thus suggesting the very hemianaesthesia he is trying to discover. Quite commonly the examination is accompanied by the question "Do you feel this?," a question which naturally suggests to the patient that the doctor has a doubt upon the subject, is expecting the patient not to feel the pin point, and soon the answer comes, "No, I do not feel it"; or "I hardly feel it at all."

Another point now becomes evident upon further investigation. If the physician test a healthy or normal individual for hemianaesthesia making at the same time free use of suggestion both direct and indirect, he invariably fails to develop the symptom. In other words, the fact whether a hemianaesthesia is or is not developed depends upon the previous existence of hysteria in the individual. The normal individual repels, the hysterical individual accepts the suggestion. It is this vulnerability to suggestion which constitutes hysteria.

Again, when we analyze the symptoms of the sensory loss, e. g., a hemianaesthesia developed in a given case, we find, as a rule, that sensation is not entirely lost. The patient does feel but says that he does not feel as well as upon the opposite side of the body; in other words the symptom developed is that merely of a diminished sensation, a condition which has received the name of hypoaesthesia or hypaesthesia. When the test is being made, the question of itself—for the test is a question even when the physician does not ask it in words—arouses first a doubt in the person's mind, followed immediately by a realization that the symptom is expected to be present, and, finally, that it is present. The mental phases are in rapid succession: "Do I feel it?" "No, I don't feel it as well as on the other side." "No, I don't feel it." In keeping with this fact, a sensory loss mild at first—a hypaesthesia—frequently passes into a sensory loss that is pronounced—an anaesthesia. Especially is this apt to ensue in a much examined case.

Further, that the sensory loss is not really existent, is proved by a number of facts. Quite frequently during an examination, as we shall see, painful superficial areas are developed over various portions of the patient's body; for instance, beneath the breast, over the groin and elsewhere over the trunk or limbs. It is an astonishing fact that commonly after a hemianaesthesia has made its appearance, painful areas can be developed on the very side in which loss of sensation has just supposedly been demonstrated! Again, the unreal character of the loss is shown in the fact that it may vary in its distribution and in its degree; indeed it may be shifting and quite inconstant; it may come and go. It is not surprising that under such circumstances an unexpected prick with a pin or contact with an electrode may cause the patient to give vent to an exclamation or cry, make a sudden gesture or reveal by some other sign that the impression was felt. Finally, as a matter of scientific interest, it may be added, that if the patient be hypnotized it can be readily demonstrated that he does feel in the supposed anaesthetic area.

I can myself abundantly confirm the statement of Babinski that when suggestion is avoided, loss of sensation is not observed; i. e., provided the patient has not been previously the subject of medical study. In testing for sensation I never direct the patient's attention to this function. When I examine a limb, for instance, I do so with the apparent intention of examining the condition of the muscles or joints. As I begin, I say to the patient with some apology of manner, "My hands are not cold, are they?" The patient answers "yes" or "no," may timidly permit the manipulation of the limb, may flinch if undue pressure or a little vigor is used, may declare that this or that hurts her, but the idea of the limb being dead to feeling, never occurs to her. Indeed, if care be not exercised the opposite idea may be bred in the patient's mind, namely, that the limb is tender and painful. If, on the other hand, the answers and comments of the patient are such as to point to an actual sensory loss, the truth can easily be demonstrated by an unexpected pinprick made by stealth, and, if real organic loss be shown to be present, the symptom may then be elaborately studied by means of instruments of precision, aesthesiometers, camel's hair brushes, cotton-wool, cold and hot test tubes and the like, but in no case, especially if hysteria be deemed a possibility—and it always is a possibility—should instruments or appliances of any kind be used in the beginning. The obvious suggestion resulting from their employment makes them inadmissible.

That which is true of the development of the symptom of sensory loss by suggestion, is equally true of all of the other symptoms of hysteria, whether these consist of palsies, of symptoms referable to the various organs or to the general conduct or attitude of the patient. The origin and mechanism of a suggestion is not always so easy to trace as in the devlopment of an anaesthesia. Frequently, too, the suggestion is indirect in action and entirely unexpected. This is well illustrated by the following case. Some years ago Professor Raymond of Paris presented at the Neurological Society of that city, a young woman suffering from a hysterical hemiplegia with contractures. The history of the case was that the patient and her husband, recently married, had spent their honeymoon at the sea-shore, and it so happened that in their daily walks they met an old man suffering from hemiplegia. No comment was made by the young woman, but some time after returning to her home, she began to walk as did the old man, while her limbs also assumed the position of fixation and contracture. Obviously such a result could only have occurred in a person in whom hysteria has pre-existed. In like manner one hysterical patient may excite similar symptoms in another. The imitation may have the appearance of being purposive and voluntary though in reality having its origin in suggestion.

In addition to the vulnerability to suggestion, the hysterical subject presents in his mental makeup certain other features in keeping with this feebleness of resistance. Thus, just as impressions suggestive of various symptoms are followed by an undue reaction, so does the patient present an excessive, a pathological reaction to emotional stimuli. That the hysterical patient laughs and cries more readily than do other persons is a fact of common experience. Emotional instability and exaggerated emotional expression are symptoms of every day observation. Similarly the hysterical person is more readily frightened than is the normal person. Again, the fright may be out of all proportion to its cause. Very frequently the latter is trivial; so much so, at times, as to be practically non-existent. Finally, the outward manifestations of the fright may be, and commonly are, greatly in excess of the actual emotion experienced. This inference is justified by the not infrequent subsequent conduct of the patient, which is such as to suggest the layman's conclusion, after witnessing a hysterical fit—already spoken of—namely, that "there wasn't very much the matter, after all." Other casues than fright may of course lead to excessive emotional reactions in hysterical subjects. Such causes may be found in joy, grief, shame, the emotional shock of sexual experiences, the worry over sexual peccadilloes and like matters.

Before proceeding farther in our study of hysteria, it may be well to emphasize the three facts which the consideration of the subject have thus far revealed. First, hysteria is an affection which is innate in the individual; the hysterical woman or hysterical man is born, not made. Secondly, the special symptoms under which hysteria may reveal itself in a given case, have their origin in suggestion, in fright or in other emotional factors. Third, in the enumeration of causes, trauma—physical injury—must be omitted, for trauma unconnected with fright plays no role. It is a noteworthy fact that trauma occurring during sleep or during surgical anaesthesia is never followed by hysteria. Further, it is a matter of common experience, that persons injured during sports, in gymnastic exercises, in foot-ball, never develop "traumatic hysteria." This is true also of accidents to railroad employees, who form a notable contrast in this respect to passengers. I have never, in the large number of railway accidents in which I have subsequently examined persons supposed to be injured, found a locomotive engineer, fireman, brakeman, conductor or motorman suffering from hysteria. Physical injuries I have found, to be sure, but never hysteria, and I know that my experience in this respect is in accord with that of others. However, when the right to recover damages is present, the immunity of railroad employees disappears. Thus a trolley car conductor while off duty was struck by a falling ladder; he subsequently brought suit for alleged injuries; a medical examination revealed that his symptoms were those of an ordinary hysteria. Again, a Pullman porter claimed to have been injured by the jarring of a train; here liability existed, he having the same right to recover as a passenger. He brought suit against the railway company and upon examination his symptoms likewise proved to be those of hysteria. In Germany where workmen's compensation laws are in active operation, railroad employees form a not inconsiderable number of the cases of hysteria claiming compensation; indeed, they often prove to be among the most persistent and insistent of the pension seekers. The fact that physical injuries of themselves never lead to hysteria cannot be sufficiently emphasized. Other writers, among them Schultze, have also pointed out this fact.

PHENOMENA OF HYSTERIA

Having considered the nature of hysteria and the mode of origin of its symptoms, let us now turn our attention to the latter in detail. Hysteria being part and parcel of the makeup of the individual, its symptoms may be in evidence at any time of life. Again, inasmuch as they are mental in character, they may manifest themselves in the most varied manner. Some of them may consist, as we have already seen, of sensory phenomena, others of palsies or other disturbances of motion; some of them may consist of phenomena simulating disease of various organs and others still of phenomena simulating disturbances of the mental functions. While all of the symptoms are mental in character, it is notwithstanding convenient for purposes of study to divide them into sensory phenomena, motor phenomena, visceral phenomena and special psychic phenomena.

Sensory Phenomena.—These have in part been already considered, as has also the mechanism by means of which suggestion is effective in their production. Suffice it here to say that sensory phenomena may present themselves as a diminution, a loss, or an excess; that is, there may be elicited a hypaesthesia, an anaesthesia or a hyperaesthesia. As already pointed out, being mental in origin, these sensory phenomena bear no relation to the facts of anatomy. The nerves supplying the part and the sensory pathways and centers in the spinal marrow and brain are alike ignored. As already shown, there may be noted an anaesthesia of a hand investing the latter like a glove; such an anaesthesia, spoken of as a glove-like anaesthesia, bears, as pointed out, no relation to the facts of nervous anatomy. A similar loss of sensation may be present in the foot and leg and is then spoken of as a stocking-like or boot-like anaesthesia. Again, it may involve a segment of a limb, e. g., from the knee to the hip and is then spoken of as a segmental anaesthesia. It may on the other hand be limited to an irregular patch on the trunk, limbs or face. Such an instance is spoken of as a geometric anaesthesia. As in the case of glove-like and segmental anaesthesia, geometric anaesthesia bears no relation to any anatomical facts.

Not infrequently, as already described, a sensory loss may involve one half of the body, constituting a hemianaesthesia. A hysterical hemianaesthesia is delimited from the opposite side by a line running vertically back and front over the middle of the body sharply bisecting the latter; such a sharply defined hemianaesthesia cannot be referred to a definite anatomical lesion and we are again forced to assume a mental origin.

Instead of a sensory loss, which, it should be repeated, is usually only partial, a hyperaesthesia, there may be developed upon examination an exaggerated sensory response; i. e., a tenderness, a hypaesthesia. Such a hyperaesthesia may be widely diffused; for instance over the back, where, especially in accident cases it is very common, or over the abdomen. More frequently, however, it is noted in the form of small isolated spots, rounded or oval in shape; the so-called painful stigmata. If such an area be touched, especially when the patient has full knowledge that an examination is being made, the patient's reaction may be excessive, i. e., he will react as though the area touched were excessively sensitive or painful. This hyperaesthesia, whether diffused or occurring in small areas, is characterized by a remarkable fact; namely, if the finger of the examiner comes lightly in contact with the supposedly sensitive area the patient, as already intimated, reacts excessively—acts as though he were suffering acutely, but if the finger or the hand be now allowed to rest upon the supposedly painful area and if, without attracting the patient's attention, deep pressure be gradually made, no painful response is elicited. Clearly the patient refers the supposed tenderness to the surface only. Further, he becomes entirely unconscious of it when his attention is fixed upon some other portion of his body. If, for instance, painful areas or points of tenderness be found over the back or spine, and, if the hand or fingers of the examiner be allowed to rest on these areas or points at the same time that the patient's attention is drawn to the front of the chest, to the abdomen or elsewhere—as when the physician, his hand still resting upon the tender area over the spine, proceeds to auscult the heart and in his conversation, directs the attention of the patient to the heart's action—no response is made by the patient whether the supposedly painful area be pressed upon or not. In other words, the pain and tenderness of hysteria, like the other symptoms, are purely mental and as such are readily demonstrated to be unreal.

Areas of this so-called painful hyperaesthesia may make their appearance upon any portion of the trunk or limbs, i. e., upon any portion of the body, in accordance with the spontaneous autosuggestions of the patient or in accordance with suggestions received from without; among the latter are the suggestions following traumata, real or supposed, upon the back or other portions of the trunk, limbs or head. In addition, tender areas occur relatively frequently in certain situations, e. g., a small oval area is frequently found over the ribs just below the mammary gland and another small oval area immediately over the groin. It is suggestive too that these painful areas are found more frequently upon the left side of the body than upon the right and possibly for the same reason that, as Babinski points out, hemianaesthesia is also found so frequently upon this half of the body. When found below the breast the area is often spoken of as "inframammary" tenderness, and when found over the groin, as "inguinal" tenderness. This so-called inguinal tenderness at one time gave rise to much confusion. It was early termed "ovarian" tenderness, being supposedly due to a painful ovary, but experience soon showed that it had nothing whatever to do with the ovary. Time and again, in years gone by, the ovary was removed by the surgeon and yet, as a matter of course, the tenderness persisted. A brief investigation will always in a given case show the extremely superficial and unreal character of this inguinal pain. Thus, it may be included in a fold of the skin and actually raised from the body. Finally, it disappears in a bimanual examination, just as does the pain over the spine.

Painful spots are found with great frequency over the tips of the spinous processes, especially in litigation cases. Quite commonly they are found over the seventh cervical spinous process and over the lower dorsal and lumbar spine. At times they are limited to or are especially pronounced in certain regions, e. g., in the neck, the small of the back or at the very end of the spine, the coccyx. Quite frequently they owe their origin to the special suggestion offered by the history of the accident, namely, of a blow upon the back, but just as frequently they are met with without such a history. Not being properly understood in former years, they gave rise to the name of "railway spine" and to such other terms as "spinal irritation," "spinal tenderness," "spinal concussion." Theories of spinal anaemia, spinal congestion, inflammation of the membranes of the spinal cord or of its substance, were variously formed to explain their existence. How these were perforce abandoned we have already seen.

SELECTIONS

CLINICAL NEUROLOGY

A New Sign of Sciatica.—None of the evidences of sciatica, such as pain over the nerve, Lasegue's sign, muscular atrophy, modifications of electrical reactions, scoliosis, elevation of the heel in walking, fibrillary contractions of the leg muscles, clonus of the glutei, abolition of the Achilles reflex, lessening of the gluteal fold, etc., is in itself pathognomonic of the disease in question, and in a given case some of them will be absent all the time. Hence, a true pathognomonic sign would prove of great value in cases where rapid and certain diagnosis is necessary. Pisani believes that he has discovered such a sign in connection with the behavior of the abdominal reflex on the affected side (Malpighi, July 1-15). He has found this to be the predominating symptom in every case thus far examined. It consists in the fact that the reflexes are less pronounced or absent on the sound side. The superior, median, and inferior reflexes should all be tested. The patient lies on his back with his abdominal walls fully relaxed, and the limbs extended symmetrically. The predominance of the reflex on the affected side is not in itself strictly pathognomonic, but is found in over 80 per cent. of all patients examined; while the presence of this phenomenon in non-sciatic cases means some condition which could never be confounded with sciatica, the sign has all the force of actual pathognomonic symptoms. As already stated no negative results have yet appeared.—Editorial, Medical Record.

An Outline of the Elements and Treatment of Stammering.—Ann Bradstreeet Stedman (Boston Medical and Surgical Journal, December 7, 1916) says that with the cases of structural defect, stammering is of purely mental origin; otherwise the expression in faulty speech of the neurotic temperament. Therapy must therefore be based on this fact. Two methods are used: One, used by physicians, aims to cure by working from the inside out, that is by giving all the attention to the frame of mind when speaking; the second, employed by teachers not of the medical profession, endeavors to treat from the outside in by the use of vocal exercises, without regard to the mental element. Now the stammerer can produce perfectly normal consonants and vowels when unembarrassed, and practical treatment of the habit, vocal exercises, etc., are only half the battle. The treatment must go deeper until it reaches the fear—the emotional disturbance that occurs under trying circumstances between the thought and its expression. It is here that the training of a neurologist is required, as stammering is as truly the province of the neurologist as any other nervous affection. The layman in teaching this condition narrows his field and must depend on the personal touch. Often, to tell a child who is constantly bracing himself for difficulties, that he need not do the things he dreads, is followed by surprise, gradual relaxation, and a new perspective, which is a great help to normal speech. In a public clinic this plan cannot be carried out, so class treatment must be resorted to, which is of inestimable benefit in many ways, but aside from benefit to the stammerer it shows to the teacher the weak spot in the patient's progress, and then improvement, though frequently hard won, is no longer superficial. Elemental speech exercises, principles of singing, elocution, and phonetic breath control, and relaxation, are methods all employed. These cannot be followed out alone at home, no matter how conscientious the pupil; the newly acquired mode of speech must be used constantly until it becomes mechanical. In the majority of the patients, character plays an important part in the recovery. Will, perseverance; and ambition make up the final third when a patient has been brought two-thirds of the way toward normal speech. Besides the above mentioned aids, a change has to be brought about in the patient's attitude of mind; something has to relax, to let go before the force of ambition can even be appealed to. Character—moral force, that is—is not synonymous with mental make-up, and it is the stammerer's mental makeup, for which he cannot be held responsible, which is at the bottom of his trouble. Cure the habit, but cure the mind as well.—Index of Oto-Laryngology.

REFLEX COUGH.—A. B. Bennet (Medical Record, January 27, 1917) divides these into three classes: (1) Cough, due to a reflex through the pneumogastric itself and through the pneumogastric and sympathetic combined. (2) Cough, due to a reflex originating along the glossopharyngeal and communicating directly with the pneumogastric by the communicating branch between the petrous ganglion of the glossopharyngeal and the root ganglion of the pneumogastric. (3) Cough, due to a reflex, originating in the trifacial or other cranial nerve and communicating with the pneumogastric by way of the sympathetic nerve.

There is a cough that does not come under any of the groups described and that termed a habit cough, as it exists without any ascertainable cause; upon urging the patient to exercise an effort of will to repress and suppress the cough an entire subsidence has been brought about within a few days.

He believes that over 50 per cent of the coughing which is done is unnecessary and could be controlled by the patient's will, and, if so controlled, would markedly hasten their recovery.—Index of Oto-Laryngology.

STUDIES ON THE LOCALIZATION OF CEREBELLAR TUMORS. —E. G. Grey (Johns Hopkins Bull., Sept., 1916—251) writes that anosmia is usually a distant symptom due to a secondary internal hydrocephalus and has no appreciable significance for the localization of a new intracranial growth.

Choked disc has in itself no localizing import, but with other signs it will point to subtentorial growths. Very little reliance can be placed on the involvement of the third or sixth cranial nerves as a guide to the side occupied by a new growth in the posterior fossa.

The nystagmus seen in cerebellar disease is very frequently of cerebellar origin. Many exceptions occur to the rule that the movement is slower and coarser with the eyes turned toward the tumor, but a persisting and definite difference in the size and rate of jerks suggests the side of the lesion.

Impairment of the conjugate deviation has little importance for localization. Involvement of the fifth nerve has no topographical importance unless the tumor lies in the cerebellopontine angle.

Paresis or paralysis of the facial nerve is strong presumptive evidence of the side of the lesion, and especially so when the eighth or the fifth nerve of the same side is also affected.

A slight unilateral impairment of hearing, appearing for the first time in connection with general pressure symptoms, is indicative of a lateral tumor.

Great impairment or loss of hearing in one ear under similar circumstances points to a lateral extracerebellar tumor, and expecially so when the seventh or fifth nerve of same side is involved. Tinnitus is not a reliable guide.

Vertigo is a prominent symptom of subtentorial growths, but has no significance for localization. The presence of dysarthria and dysphagia is no contraindication to operation. They are two striking symptoms of intra and extra-cerebellar new growths.

Involvement of the spinal accessory nerve is rare and corresponds to the side of the growth.

A weakness of the muscles supplied by the twelfth nerve is of no localizing significance.—Index of Oto-Laryngology.

STUDIES IN SPEECH DISORDER, NO. 5,—THE SPEECH IN ATHETOSIS.—Dr. Walter B. Swift (Review of Neurology and Psychiatry, April, 1916) writes: Athetoid speech is a constant variation in vowel form and consonant sound, clear only when correctly struck during the constantly changing contractions, or when, during rare moments of relaxation, the sounds are hit before contractions occur.

The Possibility of Voice Inheritance.—Dr. Walter B. Swift (Review of Neurology and Psychiatry, March, 1916) says: (1) Literature on eugenics and cacogenics shows that bone shapes are probably inherited. (2) The noses of the Indians, and the Greeks, and the Jews, prove this pretty conclusively. (3) The lower animals afford data that put this thesis beyond doubt. Thus it is proved that bone forms are inherited. Then what is contained in them is also inherited and, therefore, the functions that those cavity shapes subserve, such as vocal quality and utterance, are likewise inherited.

In brief, I claim abundant evidence to show the possibility of voice inheritance.—Author's Abstract.

Hysterical Mutism.—Makuen (New York Med. Jour., Vol. CIII, No. 22) reports two interesting cases of hysterical mutism. He briefly differentiates between hysteria and neurasthenia. One of his main points is the marked introspectiveness of the neurasthenic and the indifference of the hysterical to his condition. Hysteria is primarily due to a vulnerable suggestibility. Traumatism may induce hysteria, but the causal factor is probably the emotional disturbance accompanying the injury rather than the injury itself. Hysterical mutism is rare. It is more profound than any other type of mutism, and the patient seems to have forgotten everything pertaining to the power or organs of speech. He is usually below par intellectually. The patient understands when spoken to. The psychological disaggregation seems to be more in the motor than in the sensory mechanism. This condition differs from hysterical aphonia, where the patient can still speak in a whisper.

Both of the author's cases recovered. In the first one, speech returned following a nightmare or hysterical fit, during which the patient uttered several sentences normally. The second case was of unusual interest in that it was associated with an organic nervous lesion and had a positive

Wassermann and a positive Babinski. Her speech returned while she was at a religious camp meeting where she was induced to "pray back" her voice.

In his summary, the author calls attention to the brusque and gentle method of treatment. He believes that an effort should be made to "scare back" the voice, and after that to establish correct methods of speech by psychophysical training. Should this fail, milder educational measures should be used.—St. Paul Medical Journal.

CEREBRAL SYPHILIS.—Karpas (Interstate Medical Journal, August, 1916), before considering the clinical phenomena of the various groups of cerebral syphilis, describes the changes in the cerebrospinal fluid and blood in such conditions.

There are five important reactions: (1) Lymphocytic phenomenon; (2) the globulin content; (3) the Goldsol test precipitation; (4) the Wassermann test of the fluid; (5) the Wassermann test of the blood.

The more intense the process, the greater the lymphocytic count. An increased globulin content is a feature frequently accompanying the lymphocytosis. The precipitation of the Goldsol test is of pathognomonic significance in cerebral syphilis. The Wassermann test gives a positive reaction both in the blood and fluid. However, in old cases, the Wassermann test may be negative both in the blood and fluid, especially in the latter. Fehling's reagent is reduced in all forms of nervous syphilis except in cases in which a mixed infection is present.

The presence of spirochaeta pallida in the cerebrospinal fluid is very difficult to demonstrate.

For practical purposes, and particularly for therapeutic indications, it is deemed advisable to divide cerebral syphilis into the following groups:

1. Meningitic: (a) acute, (b) chronic.
2. Gummatous.
3. Endarteritic.
4. Mixed.
5. Degenerative.

The acute form of syphilitic meningitis presents certain striking features which are different from the other infectious forms of meningitis. It is afebrile in course unless complicated by some other infecting organism. Rigidity of the neck, Kernig's sign, and photophobia are rarely manifest. Headaches, vomiting, drowsiness, and general fatigue form a part of the clinical picture. Furthermore, transitory confusional states of varying duration and intensity are of frequent occurrence. As a rule the luetic infection is relatively of recent origin.

The meningitic involvement may be diffuse or circumscribed. At the base the meningitic infection may involve one or more cranial nerves, frequently the third and fourth nerves. There are cases in which an isolated nerve, such as the facial, is involved. Optic neuritis, choked discs, and atrophy, usually secondary, may be in evidence. The Argyll-Robertson pupil is not a frequent phenomenon in this form of cerebral syphilis.

The lymphocytic count is high, and the globulin content is increased. The Wassermann test in the blood and fluid is positive. The Goldsol test gives the usual reaction.

The chronic meningitis does not run a regular course, and indeed there are no pathognomonic features to typify this condition. Not infrequently the differentiation between this form of cerebral syphilis and general paralysis is extremely difficult to establish. Likewise, in many instances the anatomico-pathological features may simulate those of general paralysis.

Gumma occurs single or multiple, but the latter more frequently, especially in the brain. It may be of osteitic or periostitic or membranous or cerebral origin. The usual site is at the base of the brain, or in the area of the left Sylvian fissure.

The symptomatic display of cerebral gumma is practically identical with that of cerebral neoplasm, but the Wassermann test in the blood and fluid is positive, the lymphocytic count is relatively high, depending upon meningeal irritation, the globulin content is increased, and the Goldsol test is present.

Endarteritic symptoms of cerebral syphilis are practically the same as in cerebral arteriosclerosis. The prodromal symptoms are headaches, dizziness, insomnia, vertiginous attacks, and general psychic alterations, manifested in irritability and reduction of intellectual activity. Huebner describes peculiar states of semi-confusion, during which time the patient may do all kinds of peculiar things for which he shows a certain degree of amnesia. Apoplectiform attacks either of a thrombotic or hemorrhagic origin, with motor disturbances, aphasic symptoms, and other focal symptoms, frequently occur.

In this group of cases the Wassermann test in the blood is usually positive, but the fluid may give negative findings.

The degenerative group includes general paralysis (cerebral level) and tabes (spinal level.) In general paralysis the Wassermann test is invariably positive both in the blood and fluid. Likewise, there is a lymphocytosis of the cerebrospinal fluid, the intensity of which depends upon the degree of meningeal irritation. The globulin content is increased, and the Goldsol test gives the usual characteristic curve. The organisms have been found in many cases of general paralysis. According to Noguchi and Moore they were demonstrated "in all layers of the cortex with the exception of the outer or neuroglia layer."

The mental symptoms in cerebral syphilis vary. In some cases the picture may simulate any of the clinical varieties of general paralysis. Again delirious confusional states, particularly in the meningitic form, are often encountered. It is interesting to note that mild confusional episodes with fabrications, transitory and recurring in nature, varying from a few hours to several days, occur in syphilitic meningitis. There are clinical pictures which are characterized by depression, agitation, later developing manic symptoms with expansive ideas. A Korsakoff symptom-complex, acute hallucinatory states, and chronic hallucinosis with delusional ideas occur in various forms of cerebral syphilis.

In considering the prognosis of cerebral syphilis, it is necessary to bear in mind the extent of the actual damage to the nervous tissue, the constitutional resistance and the reaction to therapeutic measures. In the acute meningitic form of cerebral syphilis the prognosis is relatively good, and under active and persistent treatment recurrence may be obviated. The outlook in chronic meningitis is not very encouraging because the patients do not yield readily to therapeutic measures, and furthermore defective symptoms frequently remain. In cerebral gummata, partial or even complete restoration is possible, depending, however, upon the intensity of the injury sustained by the nervous tissue. In the endarteritic form the prognostic outlook is decidedly poor.

Since the demonstration of the spirochaeta pallida in general paralysis, many clinicians became infused with undue optimism regarding its treatment, and felt that by exerting a direct germicidal action on the trypanosome the disease could be actually arrested and even a cure would be possible. However, it should not be forgotten that the pathological condition in general paralysis is decidedly of a grave nature, and that even by arresting the activity of the spirochaeta pallida complete or even partial restoration of the destroyed tissue is hardly conceivable. Nevertheless, this should not deter one in applying every possible anti-luetic remedy to cases of general paralysis, especially in the early stages.

Briefly stated, the treatment should be directed along the lines of removing the focal symptoms, ridding the system of the poison, and strengthening the constitutional resistance.

In all cases in which the usual contraindications are wanting salvarsan and neosalvarsan should be administered. It is always wiser to begin with a small dose in order to test the patient's constitutional tolerance. On the day following the administration of salvarsan, mercurial injections or inunctions with potassium iodide should be given. It is preferable to employ mercury salicylate injections because of rapid action and general cleanliness. The first dose should never exceed a half-grain. However, the drug should be gradually increased until constitutional tolerance has been attained. In hospital work three grains a week can be used, but in private practice mercurial injections should be limited to two grains a week. In all instances the patients should be carefully watched for untoward effects. The potassium iodide should be given in increasing doses, and it is remarkable how patients with cerebral syphilis can tolerate large amounts without showing constitutional symptoms. In this relation it is important to call attention to the fact that intraspinous treatment (Swift-Ellis and Ogilvie methods) of salvarsanized serum and mercurialized serum (Byrnes) are decidedly efficacious in the treatment of cerebral syphilis. In instances where acute inflammatory symptoms are intense, it is better to control them by ordinary methods before instituting the intraspinous therapy.

Concerning the question of latent syphilis, Solomon holds that in the course of syphilis the latent period represents merely a shorter or longer remission.

A positive Wassermann reaction, indicative of latent syphilis, is an indication for careful examination, lumbar puncture, and antisyphilitic treatment.

The primary and secondary symptoms of syphilis, in comparison with the later manifestations, are relatively benign.

Adequate treatment during the period of latency is insurance against dangerous or incurable conditions of the later stage. It is essential for the prevention of physical and mental disease.

Treatment should be continued until the patient can be declared cured.

In regard to the margin of error in the Wassermann reaction, Simons-Jones-Goddard contrasted the technique and readings of two laboratories:

The results with proper technique should yield a very high percentage of agreements. In their hands this reached 93.5 per cent in 1000 tests.

Some of the error is due to the difficulty in the standardization of the sheep blood, the complement, and the amboceptor, inasmuch as higher results were obtained when both laboratories used the same reagents.

More of this error was eliminated when in addition to this the same antigen was used in both laboratories.

It is advisable that two or more specimens of Noguchi's acetone insoluble fraction antigen be used in the Wassermann reaction.—Therapeutic Gazette.

The Ocular Causes of Headache.—Bedell (Albany Medical Annals) reaches these conclusions:

1. Ocular headaches may be the result of a refractive muscle error or local inflammation.
2. Ocular headache, although most common in the afternoon, may be at any time of day or night.
3. The headache of middle life demands careful ocular examination.
4. Ocular headache may be present even with perfect distant and near vision.
5. In no case is the eye excluded until a cycloplegic has been used.
6. Occipital pain and nape of the neck discomfort extending even to the shoulders is often of ocular origin.
7. When proper, correct lenses are ordered, they must be worn as directed and must be accurately placed before the patient's eyes.—Dominion Med. Monthly.

Acute Syphilitic Meningitis.—Bronstein (International Clinics, Dec., 1916) considers that the term acute syphilitic meningitis should be more particularly applied to acute meningeal phenomena of the secondary period, sometimes preceding, but more frequently accompanying the cutaneous manifestations of this period. The pathology is essentially a meningovascularitis with hypersecretion of the cerebrospinal fluid. Prodromal symptoms, such as headache and insomnia, may or may not occur. Acute syphilitic meningitis at its height presents the clinical picture of the tubercular form, differing from the latter by the indistinctness of the symptoms, such as contractures and stiffness of the neck, and by the absence of any marked disturbance of the pulse and respiration. In the luetic form fever is apt to be absent and there may be remissions and relapses. Lumbar puncture reveals a considerable hypertension of the cerebrospinal fluid, albumin in quantity, and a marked lymphocytosis with plasmozellen. The cerebrospinal fluid may yield a positive Wassermann even when the blood serum is negative. Other manifestations of syphilis are to be looked for. The immediate prognosis is rarely fatal but the ultimate prognosis should be reserved. Prophylactic treatment is recommended whenever the cerebro-spinal fluid shows a lymphocytosis, even when all meningeal symptoms are wanting. The treatment consists in frequently repeated removal of the cerebrospinal fluid in considerable amount, combined with intravenous injection of cyanide of mercury and intraspinal injections of colloidal mercury. Neosalvarsan or salvarsan have a much more rapid action, but must be prudently handled in neurologic lesions of syphilis.

A CLINICAL CONSIDERATION OF MIGRAINE.—Litchy (International Clinics, Dec., 1916) considers migraine to be the most frequent headache, occurring in 700 of his 15,000 patients sick from all casuses. He believes that the so-called acidosis in children may often be a forerunner of a well established sick headache habit. The interesting relation between migraine and epilepsy deserves further study. Among the author's 15,000 patients epilepsy occurred in 7, and both migraine and epilepsy in 70. Auerbach's theory which attributes migraine to an actual disproportion between skull-capacity and volume of brain, needs further proof. The author shows that the diagnosis is easy when there are headaches which are unilateral, periodical and herditary, but when only one or two of these symptoms are present, or when there is only a periodicity of some of the minor symptoms or possibly of the aurae, the diagnosis may be difficult. Migraine is frequently mistaken for pelvic disease, for acidosis or cyclical vomiting in children, and organic disease, when some of the autrae are present. The psychasthenic and the gastric symptoms frequently lead to confusion in diagnosis. While the underlying causes of migraine are vague and furnish little light as to treatment, much can be done to ameliorate the symptoms by proper handling of the exciting causes that aggravate the patient's general condition and precipitate the attacks. Most thorough investigation and careful individualization are indicated. Systematic administration of the bromide salts and avoidance of undue fatigue are especially recommended.

NEURO-THERAPY

Alcohol Injections in Trifacial Neuralgia.—Benedict (Southern Medical Journal, December, 1916) says there are certain advantages and also disadvantages in treating cases of trifacial neuralgia (tic douloreux) by the injection method. However, the advantages outweigh the disadvantages, and this method should always be used before radical procedures are attempted.

The advantages are: First, a general anesthetic is unnecessary and contraindicated.

Second. When the nerve is injected the relief from pain is almost immediate.

Third. There should be no mortality.

Fourth. The patient is incapacitated only about twenty-four hours.

Fifth. Injection failing, you still have the radical operation to offer.

The disadvantages are: First, in a small percentage of cases it is impossible to inject the nerve or nerves.

Second. The relief from pain lasts only from six months to two years.

Third. There is a slight danger of injecting one of the motor nerves.

Before attempting the injection, one should have a thorough knowledge of the anatomy of this region; a skull and a graduated round pointed needle are essential. The injection should not be attempted on the live subject until much work has been done on the cadaver. The injections are to be carried out under the same rigid aseptic technique as for any major operation.

Certain points in the technique we have found it advantageous to vary, and believe that the results we have obtained have justified us in making these changes. Measurements as to location of basal foramina are only approximate, and the sense of touch and statements of the patient are more to be relied on.

Complications in doing injections are rare and when they do occur they are of minor importance, as they do not endanger the patient's life. Of our series of cases the most difficult one that we have ever had to inject has also proven to be the one receiving the most benefit, as this man has gone for over two years without a return of his neuralgia.—Author's Abstract in Medical Review of Reviews.

NEURO-PHYSIOLOGY

THE POSSIBLE FUNCTION OF THE CEREBROSPINAL FLUID.—W. D. Halliburton (British Medical Journal, Nov. 4, 1916) gives the normal characteristics, composition and fate of this fluid and its pressure. In speaking of the means of communication between the cerebrospinal fluid and other parts of the body, or rather the lack of it, he calls attention to the fact that Dixon and he found that dyes added to the fluid travel along the course of certain cranial nerves, especially the olfactory nerve. Such is not the case with the spinal nerves; no dye can be detected in their sheaths outside the spinal canal, and no dye is discernible in the lymph of the thoracic duct. Clinically the olfactory outlet is important as it affords an opportunity for the entry of infective agents. He draws attention to the apparently analogous relation of the cerebrospinal fluid and lymph, but while the essential feature of a true lymph is the free interchange between it and the blood in both directions, this is lacking in cerebrospinal fluid; at least it appears to be permeable to substances passing from it to the blood; but impermeable (except for oxygen) in the direction from the blood to the fluid. Halliburton says that he has been led to take the following view: The nervous mechanism being so sensitive, so easily influenced by anything unusual, the neurons must be bathed in an ideal physiological saline solution to maintain their osmotic equilibrium; the trace of protein it contains is probably quite sufficient for nutritive processes. The sugar would serve for a supply of energy. The choroidal epithelium is really exercising a protective function by keeping out harmful proteins (toxins, etc.), while some harmless ones are kept back almost completely; all share the same process of exclusion. This protective action also applies in addition to the majority of soluble drugs; this may operate so as to be detrimental in diseased conditions, but one can hardly expect discrimination on the part of the epithelial secreting cells. The non-access of metallic and other poisons to the nervous elements is such a sine qua non for their health that during those periods when substances are given for the relief of disease or the slaughtering of parasites the choroidal cells are unable to change their habits, and so do not allow the drugs to get through. Such, Halliburton states, he believes to be the real significance of this remarkable secretion. —Medical Record.

PSYCHO-THERAPY

A Psychological Analysis of Stuttering.—Dr. Walter B. Swift (Journal of Abnormal Psychology, October-November, 1915) summarizes as follows: In very brief form a complete, automatic, visualization process may be developed by vocal drill in cases where previously there was total absence of all these visualization processes during speech.

In relation to the stuttering, the symptoms disappeared in proportion as the picturing processes developed. This may therefore be considered as the "new treatment indicated" in the article in the Journal of Abnormal Psychology. I next plan to present a long series of such cases so treated, presenting both the original absence of picturing and its final development. By that time I think I will be ready to give out my system of treatment in final form.—Author's Abstract.

Psychoanalysis.—Charles A. Mercier (British Med. Jour., Dec. 30, 1916) shows no quarter to the psychoanalysts. He states that at present there is no systematic exposition of psychoanalysis; the writings of Freud and Jung, the chief priests of the cult, are disconnected, and from them we have to pick out the principles as best we can from among detailed records of individual cases. From this it has resulted that some of the most enthusiastic devotees of psychoanalysis have not grasped its principles. The first step towards the mastery of this cult is to obtain a command over its vocabulary, the chief term of which is "The Unconscious." Mercier states that many have tried to define it, but none have succeeded. "Libido" is another popular term, which has both an esoteric and exoteric meaning. To the initiated, Mercier considers it means lust, morbid and unnatural. Its exoteric meaning, to those not fully initiated, is explained as having the meaning of "wish," or "energy," or some other which is quite cleanly. "Oedipus-complex" and "Electra-complex" are other terms for incestuous lust. Its two basic principles are Sexuality and Conflict. The first principal is that the key to every mental state, normal or morbid, is sexuality. However pure, innocent, and free from sexual coloring our ideas may appear to be, this appearance is delusive, for they are, nevertheless, steeped and saturated in sexuality. Nor is this sexuality which engrosses all our thoughts and feelings and prompts all our acts, healthy and normal in character, if excessive in amount. It is in sexuality alone that we live and move and have our being. The second principal is Conflict, the existence and activity of The Unconscious. Mercier is not sure that it is possible to understand the term, as no definite explanation has ever been given by psychoanalysts; he is not sure that it has any substantial meaning at all. It seems to represent the struggle in the mind between obscenity and chastity, which he likens to a mutiny on board ship. The mutiny is in the overboard of the ship; it represents the terrific struggle we are daily engaged in to overcome or subdue the flesh, and the struggle is carried on, not in our minds, but in our Unconscious. The Unconscious may be studied by the

Verbal method and the Dream-interpretation. Mercier understands that the psychoanalyst is desirous of getting hold of children and undermining the foundations of their so-called morality. The campaign has already begun. He considers the cult as simply a means whereby men and women of certain "too nice" types may be at liberty to freely discuss sexuality, especially the morbid, and to indulge in this manner their sexual inclinations.—Medical Record.

PSYCHIATRY

Dementia Precox—Charles De M. Sajous (Medical Record for Jan. 13, 1917) states that over one-half the inmates of our asylums, to say nothing of the many not committed, suffer from dementia precox or its complications. It stands first as the destroyer of the minds of the young. He recalls the importance of the thymus gland, which in the pathogenesis of general disease has been almost entirely neglected. The participation of the thymus in dementia precox has been suggested to him by the fact, confirmed by many clinicians, that the size and condition of the thymus was an index to the state of nutrition of the body at large. While the thymus showed itself capable of supplying nucleins to the organ of the mind, dementia precox also showed in many ways some connection with the thymus. There is the marked reduction of lymphocytes in this disease, which the therapeutic use of thymus gland corrects. Cudlum and Corson White obtained excellent results in three out of six cases of dementia precox. The familiar functional relationship between the various ductless glands suggested that asthenic disorders of the latter should show some mental kinship with dementia precox. The stigmata of thymus deficiency were briefly: (1) deficient development of the osseous system and of the epiphyses, and deformities suggesting rickets or osteomalacia, due to the inadequate assimilation of calcium owing to the deficiency of thymic nucleins which took part in the building up of calcium phosphate. (2) Deficient mental development due to insufficient production of thymic nucleins to supply the neurons of the central nervous system during its development. (3) A low relative leucocyte count, due to the inadequate formation of these cells by the thymus. The diseases of children are also important in the genesis of dementia precox. —Cleveland Medical Journal.

Role of the Endocrine Glands in Mental Disease. —Serradell, in a recent thesis of Toulouse (Journal de Medicine et de Chirurgie Pratiques) refers first to the psychic disturbances which accompany menstruation, and which are characterized by irritability, exultation, motor excitability and also by indifference and apathy; while in certain cases true psychotic · states are present. After ovariotomy women show apathy, irritability, sadness, weakening of memory, suicidal ideas, etc.; also psychoses of confusion or melancholia. The mental peculiarities and psychoses of the menopause are well known. But nearly all endocrine organs may play some part in mental troubles. In exophthalmic goiter maniacal states, melancholia and mental confusion have at times been seen. In acromegaly, dementia, melancholia and delirium of persecution may occur. In adrenal insufficiency, the syndrome may include slowing up of the intellectual faculties, melancholia, and neurasthenia. Furthermore, in autopsies on the insane alterations of the endocrine glands are often apparent even although certain symptoms may have been absent. The good results of opotherapy on the insane represent further documents, the most striking having been noted in connection with psychic and somatic infantilism. The glands chiefly given are the thyroid, ovary and adrenals.—Medical Record.

NEURO-DIAGNOSIS

Study of the Spinal Fluid in Poliomyelitis.—Dr. Philip C. Jeans (Jour. Missouri State Med. Assoc.) states that the examination of the spinal fluid is necessary for diagnosis in preparalytic and abortive cases of poliomyelitis since the diagnosis cannot be made with any reliability from the clinical features alone. There is no laboratory measure that is pathognomonic of this disease and it would seem advisable to extend our routine methods of examination as much as would prove helpful. The Lange colloidal gold reaction with spinal fluids from one hundred cases of poliomyelitis occurring in the New York epidemic is studied to determine its value as a diagnostic measure. It is found that, though often helpful, this reaction is not of any great assistance in differentiating poliomyelitis from other meningeal affections having a clear though pathological spinal fluid.

In about 10 per cent. of the fluids studied, the Lange reaction was practically the only evidence that the fluid was pathological. This evidence of a pathological change is not necessary for diagnosis in a paralytic case, but in a preparalytic or abortive case it is of considerable value in connection with the clinical manifestations. In 10 per cent. of the nonparalytic and abortive cases studied, the colloidal gold reaction was the only evidence of a pathological change in the spinal fluid and is important evidence that these patients had poliomyelitis.

EXPERIMENTAL TUBERCULOUS MENINGITIS.—Austrian (Johns Hopkins Bulletin, Vol. XXVII, No. 306) reports his results on tuberculous meningitis experimentally produced in rabbits. He used two types of tubercle bacilli, bovine and human. The bacilli were grown on glycerin agar for two weeks and a suspension in 85 per cent salt solution was used. From 1 to 1.5 c. c. of this suspension was slowly injected into the spinal canal of rabbits. Thirty-five animals were used, and the course of the disease of six is given in detail.

The incubation period of the disease due to the bovine type of bacillus varied from eight to fifteen days; in the human type from seven to twenty days. The duration of the disease due to the bovine type varied from nine to fourteen days, and of the human type from sixteen to twenty-eight days. In all cases the results were fatal.

An attempt was made to treat these rabbits. Four methods were employed:

1. The intraspinous injection of "albumose-free tuberculin."
2. The intraspinous injection of "tuberculinized" serum.
3. The intraspinous injection of the serum of tuberculous rabbits.
4. The intraspinous injection of leucocytes from rabbits.

Neither method gave any results, either as to the progress of the disease or as to the ultimate outcome. The author summarizes his results. He suggests that it would be a simple procedure to introduce into the spinal canal of a rabbit 1.0 to 2.0 c. c. of the spinal fluid of a patient thought to have tuberculous meningitis, and in a few days examination of the rabbit's meninges might give evidence of the tuberculous nature of the patient's disease. This might be of great help in the early diagnosis of tuberculous meningitis in man.—Saint Paul Medical Journal.

Diagnosis of So-Called Sciatica.—Drs. E. W. Bedford and E. O. Raven (Medical Record, Dec. 9, 1916) report that in the study of 400 cases admitted to the Cook County Hospital, with a tentative diagnosis of sciatica, "it was found that approximately one-half showed definite and various conditions that were not sciatica at all, but in which sciatica was merely a symptom." Roentgenograms are made in every case and orthopedic considerations are most thoroughly studied. It was found that numerous and variable clinical entities presented sciatic pain as the chief symptom.

Of the diseases or conditions which had been erroneously diagnosed as sciatica, eight cases proved purely functional (hysteria and neurasthenia), the rest were organic, of which the following is a partial list:

Cerebrospinal cord lesions have been mistaken for sciatica 13 times; tabes dorsalis, 7 cases; acute pneumococcus meningitis, 2 cases; cerebrospinal lues, 1 case; chronic anterior poliomyelitis, 1 case. In other words, instead of various cerebrospinal cord lesions, a diagnosis of sciatica was made.

Diseases of the spinal column: Tuberculosis of the spinal column was overlooked in two instances; spondilitis deformans in 11 cases; old fracture of the spine in 1 case; scoliosis in 2 cases, and kyphosis in 1 case. Mild or incipient cases of spondilitis deformans are more numerous than the other members of this group because it is only with the aid of a Roentgenographic examination that a positive diagnosis can be made in some cases.

Conditions of the sacroiliac joint: Tuberculosis of the sacroiliac synchondrosis was discovered in 5 cases; sacroiliac arthritis in 2 cases; sacroiliac strain in 5 cases. Dystocia caused symptoms of sciatica in three instances. A history of trauma or strain was secured in 24 cases in which sciatica pain appeared after heavy lifting, contusions to pelvis or hip, etc.

Pelvic lesions comprised the most striking causes of sciatica symptoms, of which blastomycosis combined with pelvic abscess, 1 case; retroperitoneal sarcoma, 1 case; carcinoma of pelvic bones secondary to cancer of breast, 2 cases; carcinoma of uterus and pelvis, 1 case; thrombophlebitis of common iliac vein, 1 case; retroperitoneal abscess, 1 case; ischiorectal abscess, 2 cases; fibroid of uterus, 2 cases; retroversion, 1 case; gonorrheal prostatitis, 1 case.

Hip joint lesions: Tuberculosis, 8 cases; chronic arthritis 6 cases; arthritis deformans, 6 cases; acute articular rheumatism, 3 cases; subacute articular rheumatism, 3 cases; chronic articular rheumatism, 3 cases; arthritis, 1 case; gonorrheal arthritis, 2 cases; contusion, 1 case; relaxation of the ligaments of the hip after an old dislocation, 1 case; old fracture of the neck of the femur, 2 cases.

Other diverse conditions affecting the lower extremities, causing sciatica manifestations, were: intermittent claudication, 1 case; erythromelalgia, 1 case; metastatic carcinoma of the upper femur secondary to breast cancer, 1 case; thrombosis of the femoral vein after typhoid fever, 1 case; acute periostitis of the femur, 1 case; endothelioma of the sciatic nerve, 1 case; bullet wound of the sciatic nerve, 1 case: varicose veins, 3 cases; pes planus, 4 cases.

There were numerous cases of polyneuritis; of these, 16 were of alcoholic origin, 1 of diabetic, and 1 of typhoid. One case of traumatic neuritis was recorded.

From the classification of the groups mentioned above one can see how numerous the causes of so-called sciatica may be and how imperative it is in any case of sciatica to attempt to locate the source of these pains.

The paper is illustrated by case reports and contains a list of references to the literature germane to the subject.

NEURO-PATHOLOGY

The Relation of Mouth Infection in Goitre.—E. H. Reede (Washington Med. Annals, 1916, XV, No. 4, 230-236) describes a number of cases from his practice, of the coincidental occurrence of thyroid enlargement and oral sepsis in which the infection seemed to affect the gland independently of the tonsillar or other source of infection. He states that the ground work of any hyperthyroidism is laid in a hyperplasia of the secreting epithelium, which, when it is marked, is called goitre. He believes that the hyperplasia is in all cases the result of bacterial irritation. In a series of some 50 cases of his practice, below the age of 12 and as early as 5, the infection was coincident with a chronic gingivitis dependent upon the decay of the first teeth, and from this Dr. Reede infers that a certain proportion of thyroid dystrophia may originate in childhood.

The symptom complex, so common in school children, is characterized by the presence of a goitre, a gingivitis, and generalized incoordinate movements of the muscles. He illustrates this condition by several practical cases.—Index of Oto-Laryngology.

Is Graves' Disease of Neurogenic Origin?—If it can be shown that this affection is not of endocrine origin, the entire fabric of endocrinology might require revision. Moebius is credited with the discovery that Graves' disease is simply hyperthyroidism; while Oswald holds the view that the neurogenic factor is paramount, and that the malady never develops in one with a sound nervous system. The thyroid lesion is the result of an emotional or psychic insult, and is a mere epiphenomenon. A writer in Il Policlinico for Dec., 3, cites some experiences of Rothacker during 1916, which bear out the neurogenic theory. He had under treatment six patients with Graves' disease, in which recognition and removal of the neurotic element led to a complete cure. Moreover, among the troops it is not unusual to see healthy recruits who are already suffering from physical and psychic overstrain develop under strong emotions a certain abnormal action of the heart of functional origin. It is quite possible that this manifestation is often but a part of the Graves' syndrome, and that a careful study of such cases would reveal the presence, sooner or later, of enlarged thyroid and exophthalmic goiter.—Editorial, Medical Record, Jan. 20, 1917.

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NOTICE TO NEWS AGENTS

This magazine must not be expected to print whole pages of commercially devised, fulsomely laudatory puffing of proprietary advertisements, prepared by non-medical commercial agencies who know nothing of the facts of therapeutics nor of the medical code of ethics. Some of the puffs are so far from the truth that they are an insult to medical intelligence and do more harm than good to worthy proprietaries.

Such proprietaries as we carry speak for themselves with physicians, especially when their composition appears. Our readers are discriminating judges of what they want.

CONCERNING RENEWALS OF SUBSCRIPTIONS

This magazine would be much indebted to its regular subscribers and advertisers if they would renew by direct communication with this office, especially in the United States, and not through news agents.

MARC RAY HUGHES, M. D., Editor.
Business Office, 204 N. Fourth St.

EDITORIAL

RESPONDING TO AN "ENCORE," the undersigned again appears in the role of Editor, which I believed terminated with the last issue of the Alienist and Neurologist, a misapprehension not corrected soon enough to permit the present number to be gotten out on schedule time, although I am not willing to assume responsibility for all of the delay.

It is hoped that all interested—subscribers, contributors, exchanges, advertisers and medical book publishers—will be lenient and patient until details regarding the future Editorial staff are completed.

The Journal anticipates the continued valuable assistance of all old collaborators and solicits, and will appreciate, appropriate contributions from its many other able readers, and especially during these turbulent times, when more attention is likely to be given to the subject of war than to writing on medical subjects, particularly upon Neurology and Psychiatry.

We hope for a prompt and liberal "enlistment" in this worthy cause.

David S. Booth, M. D.,
Editor pro tem.

REVISION OF LAWS GOVERNING CRIMINAL PROCEDURES.—The introduction of a bill into the Missouri Legislature to revise the statutes governing criminal procedures, is a wise and needful measure. It can scarcely said to be timely, since it should have been introduced and passed many years ago. Since the bill purports to be based upon the recommendations of the Judges of the Circuit Courts of Missouri, it should, at least, be a decided improvement upon the laws now in force. However, we believe the revision should be more sweeping and include all judicial procedures that permit unnecessary delay and often the miscarriage of justice through technicalities, etc., which have for ages been a subject for adverse criticism of the better element in the legal profession, as well as of philosophers and commentators, besides furnishing themes for humorists and jesters.

Samuel Butler, in the seventeenth century, wrote, "In law nothing is certain but the expense."

Colton said, "Law and equity are two things God hath joined together; but which man has put asunder."

Judge S. Lovejoy Taylor, Sparta (Ill.) Plaindealer, several years ago said:

"When lawyers are asked what they have done in a hundred years to simplify and improve the administration of justice they must either frankly answer 'Nothing' or preserve eloquent silence. But there is ground for hope that they will be stirred to action in the next several years. The evils of the law's delays, absurdities and technicalities are not only becoming unbearable, but the advance of efficiency and methods in all other departments of activity simply makes it impossible for jurisprudence to lag behind and become a byword and reproach.

"It is a gratifying fact that eminent judges and successful lawyers are beginning to use plain English in discussing the question and to voice the public's protests and demands for immediate reform. The other day Justice Brewer spoke strongly on the grave injustice and disgrace of our procedure and specifically characterized as 'outrages' the reversal of verdicts on trivial or technical grounds and the waste of weeks or even months in impaneling juries that on the whole are no more representative than those selected in a few hours by fair and businesslike methods."

Besides being an arraingnment, the above bids fair to become a prophecy.

The miscarriage of justice, however, is not always due to the law's delays and technicalities, since much may be attributed to "sufferance," which permits the examiner to obtain what he wants from a witness and only what he wants, thus not infrequently obtaining entirely different testimony from that which would result were the witness permitted to reply in full and not be restricted by the proverbial "yes" and "no." This is especially applicable to medical testimony.

Testimony often depends more upon the examiner than upon the knowledge of an honest witness, and more upon the wiles of the lawyer than upon legal lore, thus demonstrating the "law of compensation."

A not uncommon source of grave injustice results from the "bearing of false witness." If more attention were given to the conviction and punishment of perjurers, much good would result. Indictment for perjury is rare indeed, and conviction almost unheard of, notwithstanding all who have spent many hours in court have certainly heard testimony which they knew to be false.

Professor Benussi, of Graz, is accredited with having discovered a means of detecting when one is telling a lie by the breathing, but we fear the inadequacy of such a test in courts, since those who thus indulge, do so with such abandon—even *sang froid*, that we predict it will take more active measures to "trap" them.

Grave injustice often arises from the practice in some courts of permitting the cross-examiner to read from a text-book and ask the witness if he agrees with it.

The writer had occasion to disagree with the following which was read from a well-known text-book: "The profession should recognize that traumatic neurasthenia and traumatic hysteria are serious and disabling conditions,"—truly a very unjust statement when taken alone, though mollified somewhat by the sentence which follows it, viz: "Every case must be specialized, and the amount of disability and the probability of its duration must be estimated from all facts," and though the witness was aware of the presence of the last sentence, we did not call attention to it, lest we be considered a "paid partisan."

Upon writing the author regarding the matter, he freely acknowledged the fact that these conditions were certainly not always serious, etc., and said, "the work was written for physicians with judgment and not for use in court;"—notwithstanding, there has been no revision in a later edition of the work, hence nothing to prevent the continued unjust misuse of the work.

Other sources of error are: Permitting the attorney bar to get before the jury knowledge he knows is not permissible and to which he well knows objection will be made and sustained, but he is aware of the subconscious psychic effect of that knowledge upon the jury; permitting the attorney, in his closing argument (?) to the jury, to inject his own conclusions (?) and make statements which appear as facts (?) which have not been proven and, often, upon which there has been no evidence whatsoever, and, further, permitting the common, but reprehensible practice of denouncing witnesses for no other cause than that they gave damaging testimony, and the more damaging the testimony, the greater the vilification—all these practices should be heavily penalized.

Regarding the latter, a lawyer-editor of a rural weekly once wrote in humorous vein:

"Lawyers stand up in the court houses before jurors, in the presence of large audiences and denounce men as liars, scoundrels, thieves and perjured villains, and when court adjourns the men appear to harbor no ill will against them. But let a newspaper faintly intimate that a man's character is blemished and the editor has to confront a gun, stand a libel suit or suffer what the people think to be the greatest of all mortifications—lose a subscriber."

We reply seriously that witnesses so denounced, often, at any rate, do "harbor ill will," if not resentment, but what can be done? Will the legal profession enlighten us? Aye, will it "estop" it?

It would appear that the office of Judge should not be elective and the tenure should be for life unless terminated for just cause.

A Judgeship should require character, as well as wisdom, in the occupant.

Finally, should the legal profession purge itself of the shyster, as the medical profession is doing with the quack, much will have been accomplished toward correcting these evils.

In conclusion, there is a great difference between "law as practiced" and "practical law," and equally as great, between "law" and "equity."

Who's move is it?

THE WORKMAN'S COMPENSATION ACT, which was introduced into the Missouri State Legislature, has furnished the opportunity for much adverse, and we believe, unjust criticism of the medical profession, some of which has come from "within the ranks."

Though it was not unexpected that those who would suffer pecuniary loss by the passage of this bill, would grasp at every straw to protect themselves, we were surprised by an editorial of an esteemed contemporary under the caption "Are Physicians Honest?" in which the author expresses mistrust of the "Contract Doctor," and voices his accord with an original article written by an attorney, which appears in the same Journal and in which the writer says: "The physician employed by the employer to treat an employee secures the confidence of his patient, and then, on behalf of his employer, to hold his job, frequently minimizes the injury, gives false advice and perjured testimony," etc. We can not refute this because we are not in a position to know that it may not have occurred, but we do deny that it is necessary or that it often is done or expected. We deny that a "contract" with an employer to render professional services to his employees, is an obligation to divest the physician of his conscience, honesty, or even his individuality.

We protest any such intention or necessity, and contend that if the attendant does assume such an obliquity, it is because he would do the same in private practice, and not because his "contract" carries either such a solicitation or implication; and that such an attitude is at his peril, since by misleading the employer, unnecessary and unsuccessful litigation would thereby result, the "cause" and "effect" of which the employer would not be slow to recognize.

The original article referred to, states as a fact that "contract physicians" give perjured testimony; as an attorney, if he knows such to be the fact, he certainly knows how to proceed in order to convict the offender; and probably deter "potential" offenders.

We are confident that contract physicians hold no monopoly on perjured medical testimony. If it occurs at all, it is because of the character of the physician, and not because he is employed by either party to a contest; though my personal experience had been, that if the physician's findings are not to the liking of the claimant, the claimant fails to pay for the services; hence there is a greater temptation for dishonesty in the attendant when employed by the claimant than when employed and paid by a corporation; since, in the former case, the fee itself usually depends, not alone upon the physician's testimony in his patient's behalf, but upon the success of the patient's claim. The writer has never yet failed to collect from a corporation, no matter whether his opinion or testimony has been favorable or unfavorable, and he has gone so far as to testify that a claimant was bedridden and incurable.

This brings us to another contention of our legal critic, viz: "whereas under a compensation act, the physician's fees are fixed, a physician may charge regular rates to his private patients;" however, he fails to instruct us how to collect the fees from even a successful claimant.

We have several hundred dollars of such accounts we would sell at a great discount. Some of these were "guaranteed" by the claimant's lawyers, others, as we grew "wiser" by experience, were to be paid directly by the lawyers, but with no better result.

Some fifteen months ago, the writer examined a young lady upon the advice of her surgical attendant, and found a mild degree of "nervousness," as her one complaint, in which the attendant concurred, and thereafter learned that suit had been entered on account of permanent disability, as the result of which, she collected fifteen hundred dollars. I was later informed that within two weeks thereafter this "permanently disabled" young lady "danced nearly all night," and was so "changed" that she forgot (?) she owed either the attending physician, the hospital to which she had been confined for a short time or the writer. It is needless to say that the writer was not called to testify in this case.

One of the claimant's attorneys owes the writer a large personal bill for professional services, which, we understand, is not the only bill he owes physicians, hence, he could not be expected to interest himself in our behalf. Suit was entered by her attendant, with whom the writer disagreed as to the probable legal "prognosis," hence, we failed to follow "suit."

As the writer's aim is purely "defensive," this discussion is not to be interpreted as having any reference to the merits of the Compensation Act, neither is it accompanied with either enmity, malice or personalities, nor is it intended as a reflection upon the legal profession.

CREDIT BUREAU OF THE SAINT LOUIS MEDICAL SOCIETY. —The Saint Louis Medical Society has taken a long step forward in establishing a collection department and credit bureau with a view of co-operating with the various mercantile bureaus of the city.

This does not mean that there will be any hardships imposed or injustice done honest debtors, or that the indigent poor will not receive cheerful gratuitous attention, but it does signify the elimination of the "dead-beat," or he who for one or more of the various stereotyped "causes" common to this class, fails or refuses to pay for medical services, much of which is rendered in emergencies, out of regular working hours and through the kindness of heart of the medical attendant.

Alexander Pope, over two centuries ago, combined truth and poetry in the following bit of satire:

"God and the Doctor, we alike adore,
But only when in danger, not before;
The danger o'er, both are alike requited,
God is forgotten and the Doctor slighted."

It is but logical to assume that he who fails or refuses to pay one physician will, when opportunity presents, repeat the offense.

It does not appear to be generally known that physicians charge for "services rendered" and not for "results," which usually depend as much upon the patient in following the advice and instructions of the physician as upon the agencies prescribed.

The following from the Chicago News briefly defines the law regarding doctors' bills:

"Your doctor's bill, as a general rule, reads, 'For professional services rendered.' That means that you are to pay for work done and not for miracles performed. If you hire a doctor to attend you in sickness you enter a contract to pay for his expert services, whether he succeeds in curing you or not. It would be unfortunate for both parties in the contract if the terms were otherwise.

"Two things are not yet clearly understood by some people—first, a doctor's fee is collectable, and, second, a doctor is not legally bound to attend any one under any circumstances unless he wants to. You can't make a doctor work for a contingent fee, and you can't make him work at all if he chooses to refuse his services."

Former President Taft, while sitting on the bench, said: "A physician is not a warrantor of cures," etc.

It should further be known that "professional services rendered" embraces the consideration of the character of the services, when and where performed, the professional reputation of the physician, etc., and not alone the number of routine calls at a fixed rate per call.

Courts have also held that physicians' "services are rendered with a view to charging patients according to their circumstances and positions in life."

This is the only rational, just and equitable method of computing a physician's bill, and the only method which can at all times and under all circumstances insure the necessary care and attention to the patient.

The writer has had the usual experiences incident to collecting bills for medical services, but we have preserved a correspondence for future publication, of a case at a distance from the city which we believe the "limit" for contemptible hypocritical chicanery toward the several physicians involved. Under the expressed intention "to be fair," with occasional "encouragement," etc., settlement was delayed over two years until property had been sold, expressly to pay the outstanding bills, when we were informed that our bills had no legal status, etc.

When the physician has rendered services, he owes it to his dependents, to himself and not least to his colleagues, to apply ordinary business methods in collecting what is due him. Certainly there is nothing "unprofessional" or "undignified" in this.

CAMPAIGN AGAINST UNCLEAN DAIRY UTENSILS.—An active campaign against the unsterilized milk can, pail, strainer cloth, and separator, as contributing causes to high bacterial count in city milk, is to be carried on this season by the U. S. Department of Agriculture in co-operation with the health and milk officials of a number of cities.

Already health officers in 150 localities have accepted the department's offer to demonstrate to their local milk producers a simple home-made sterilizer, costing not more than $15, which if used on the farm will help guard the milk against this initial and serious contamination. How great a bearing sterilization of milk utensils on the farm has on the bacterial content of milk is shown by experiments which have proved that the average milk can, when washed in the ordinary way, may contain over eight billion bacteria, and that almost every milk can so treated harbors millions of bacteria which give a high bacterial count and hastens the souring of milk.

The effectiveness of this sterilizer has been fully proved both in the laboratory and on the farm. The device, moreover, removes foul odors and leaves the utensils dry as well as sterilized. Experience shows that the bacterial count is thus materially reduced, while the producer finds that his milk does not sour so quickly and has an improved flavor.

NATIONAL BOARD OF MEDICAL EXAMINERS.—The second examination to be given by the National Board of Medical Examiners will be held in Washington, D. C., June 13, 1917. The examination will last about one week.

The following states will recognize the certificate of the National Board: Colorado, Delaware, Idaho, Iowa, Kentucky, Maryland, North Carolina, New Hampshire, North Dakota and Pennsylvania. Favorable legislation is now pending in twelve of the remaining states.

A successful applicant may enter the Reserve Corps of either the Army or Navy without further professional examination, if his examination papers are satisfactory to a Board of Examiners of these Services.

The certificate of the National Board will be accepted as qualification for admittance into the Graduate School of the University of Minnesota, including the Mayo Foundation.

Application blanks and further information may be obtained from the Secretary, Dr. J. S. Rodman, 2106 Walnut Street, Philadelphia.

ALIENISTS AND NEUROLOGISTS.—The annual meeting of Alienists and Neurologists will be held Monday, July 9th to Thursday, July 12th, 1917, in the Red Room, LaSalle Hotel, Chicago, under the auspices of the Chicago Medical Society. Dr. George A. Zeller will act as Chairman. The program will be mailed June 28th, with abstract of each paper. Contributors to the program are solicited. This is a society without a membership fee. Address Bayard Holmes, M.D., Secretary, A. & N , Room 1218-30 No. Michigan Ave., Chicago.

MCINTIRE PRIZE.—Last year Dr. Charles McIntire resigned the secretaryship of the American Academy of Medicine after twenty-five years of faithful service. In appreciative commemoration the American Academy of Medicine decided to raise a fund, the income of which should be expended in accordance with Dr. McIntire's suggestions. As a consequence the Academy now announces two prize offers, the prizes to be awarded at the annual meetings for 1918 and 1921, respectively.

The subject for 1918 is "The Principles Governing the Physician's Compensation in the Various Forms of Social Insurance." The members of the Committee to decide the relative value of the essays awarding this prize are—Dr. John L. Heffron, Dean of the College of Medicine, Syracuse University; Dr. Reuben Peterson, Professor of Obstetrics and Diseases of Women, University of Michigan, and Dr. John Staige Davis, Professor of Pediatrics and Practice of Medicine, University of Virginia.

The subject for 1921 is "What Effect Has Child Labor on the Growth of the Body?" The members of the Committee to award this prize are—Dr. Thomas S. Arbuthnot, Dean of the Medical School of the University of Pittsburgh; Dr. Winfield Scott Hall, Professor of Physiology, Northwestern University, and Dr. James C. Wilson, Emeritus Professor, Practice of Medicine and of Clinical Medicine, Jefferson Medical College.

The conditions of the contest are:

(1) The essays are to be typewritten and in English, and the contests are to be open to everyone.

(2) Essays must contain not less than 5,000 or more than 20,000 words, exclusive of tables. They must be original and not previously published.

(3) Essays must not be signed with the true name of the writer, but are to be identified by a nom de plume or distinctive device. All essays are to reach the Secretary of the Academy on or before January 1st of the years for which the prizes are offered and are to be accompanied by a sealed envelope marked on the outside with the fictitious name or device assumed by the writer and to contain his true name inside.

(4) Each competitor must furnish four copies of his competitive essay.

(5) The envelope containing the name of the author of the winning essay will be opened by Dr. McIntire, or in his absence by the presiding officer at the annual meeting and the name of the successful contestant announced by him.

(6) The prize in 1918 for the best essay submitted according to these conditions will be $100.00; that of 1921 will be $250.00.

(7) In case there are several essays of especial merit, after awarding the prize to the best, special mention of the others will be made and both the prize essay and those receiving special mention are to become at once the property of the Academy, probably to be published in the Journal of Sociologic Medicine. Essays not receiving a prize or special mention will be returned to the authors on application.

(8) The American Academy of Medicine reserves the right to decline to give the prize if none of the essays are of sufficient value.

The present officers of the American Academy of Medicine are: George A. Hare, M.D., Fresno, Calif., President; J. E. Tuckerman, M.D., Cleveland, President-Elect; Charles McIntire, M.D., Easton, Pa., Treasurer, and Thomas Wray Grayson, M.D., 1101 Westinghouse Building, Pittsburgh, Pa., Secretary.

THE NATIONAL COMMITTEE FOR MENTAL HYGIENE.—The ninth annual meeting of The National Committee for

Mental Hygiene, Inc., was held February 7th, at the Hotel Biltmore.

Mr. Otto T. Bannard, Treasurer, announced that gifts amounting to more than $30,000 for general expenses had been contributed during the past year by four donors, one of whom had pledged $100,000 toward an Endowment Fund that is being raised. The Rockefeller Foundation contributed $34,000 for special purposes, such as surveys of conditions among the insane and feeble-minded.

Short addresses were given by Dr. Walter E. Fernald on "Supervision of the Feeble-minded in the Community;" Dr. William A. White, "Influence of Mental Hygiene Upon Methods of Dealing With Crime and Criminals;" Dr. William L. Russell, "Some of the Indirect Results Which May be Expected to Follow Our Surveys of the Care and Treatment of Mental Diseases;" Professor William H. Burnham, "The Role of Mental Hygiene in Education;" Dr. E. E. Southard, "The Community as a Unit for Mental Hygiene Work;" Dr. Henry R. Stedman, "The Teaching of Mental Hygiene in Medical Schools."

Dr. Thomas W. Salmon, Medical Director, Dr. Frankwood E. Williams, Associate Medical Director, and Mr. Clifford W. Beers, Secretary of the Committee, reported on the work of the past year. Surveys have been completed in the States of California, Colorado, Connecticut, Georgia, Louisiana, Pennsylvania, South Carolina, Tennessee, Texas, and Wisconsin and are now in progress in the cities of Chicago and New York. State Societies for Mental Hygiene are now organized in sixteen States while steps have been taken towards the organization of societies in several other States. During the coming year emphasis will be laid upon the educational work of the Committee. A feature of this work will be the publication of a quarterly journal, "Mental Hygiene," the first number of which has been issued.

The following officers for the ensuing year were elected: Dr. Lewellys F. Barker, President; Vice-Presidents, Prof. Charles W. Eliot, Dr. William H. Welch; Treasurer, Otto T. Bannard; Medical Director, Dr. Thomas W. Salmon; Associate Medical Director, Dr. Frankwood E. Williams;

Secretary, Mr. Clifford W. Beers; Executive Committee, Dr. August Hoch, Chairman; Dr. George Blumer, Prof. Stephen P. Duggan, Dr. William Mabon, Dr. William L. Russell, Dr. Lewellys F. Barker, Dr. Walter E. Fernald, and Mr. Matthew C. Fleming; Finance Committee, Prof. Russell H. Chittenden, Chairman; Mr. Otto T. Bannard, Mr. William J. Hoggson, Dr. William B. Coley.

Mortality from Cancer.—Among the significant facts brought out in a special report, "Mortality from Cancer and Other Malignant Tumors in the Registration Area of the United States, 1914," issued by Director Sam L. Rogers of The Bureau of the Census, Dept. of Commerce, we note that the mortality from cancer and other malignant tumors in the death-registration area of the United States has been increasing almost continuously for the past fifteen years. It is greater in urban than in rural localities; among females than among males; among whites than among negroes; and among persons in middle life and old age than among those in early life. Deaths due to cancer of the stomach and liver represent more than three-eighths of the total.

CORRESPONDENCE

Latah and the Like.—A brief note seems warranted by the probably imminent increase in cases of these tics. Gould and Pyle[1] give a good sketch of the older material; the omitted citations to Beard's "Jumpers of Maine" and to Hammond's "Miryachit" can be found in the Index-Catalogue[2] which, in its second series also, gives many more references.[3] The relations of these and similar neuroses are considered in "Ritual Diseases";[4] the references there to O'Brien's article can be further extended.[5] Also, especially on the Malay side of the subject, is a section in Allbutt's "System of Medicine"[6] which, in a later volume,[7] compares the various tics. Mention in Gimlette's "Malay Poisons and Charm Cures" is briefly referred to in the Medical Record.[8] Arctic hysterias (?) are treated in articles by Brill[9] and Popoff;[10] at the farthest remove, both from places being the extreme south of South America and from those afflicted being young men rather than aged women, etc., is the subject of Coriat's recent paper;[11] one might infer, from the articles of Brill, Coriat and others, that the root of these tics is unsatisfied yearnings for love on a higher plane than one would expect among peoples so primitive.

The most interesting reference in this whole note is to Miss Czaplicka's "Aboriginal Siberia,"[12] a book readily accessible in any of the larger libraries, so that quotations need not be given. It is based on items largely by Russian and Polish writers, which have been entirely unknown to us,[13] and it opens a new field from the inside. She returned, about a year ago, from a "brilliantly successful" expedition to Siberia; reports, to the two institutions which were her backers, have not yet come to hand but are well worth awaiting.

Charles-Edward Aab.

Boston, Mass., Dec. 9th, 1916.

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[1] "Anomalies and Curiosities of Medicine" (G. M. Gould and W. L. Pyle), pp. 855-857.

2. Index-Catalogue of the Library of the Surgeon-General's Office, U. S. Army, 1 series, IX, 340; and see VII, 908, s. v. "Leaping Ague."

3. Ditto, 2 series, X, 923.

4. "Ritual Diseases" (V. G. Plarr) "Janus," 1911, XVI, 732-737.

5. "Latah" (H. A. O'Brien), Straits Branch Royal Asiatic Society's Journal, 1883, XI, 143-153; "Further Notes" (H. A. O'Brien), XII, 283-285; "Extract from Forbes' Wanderings in the Eastern Archipelago," XIV, 445-6.

6. New edition (by T. C. Allbutt and H. D. Rolleston) II, part ii, 767-771.

7. Ditto, VIII, 619; VIII, 625.

8. 1915, at 280.

9. "Piblokto or Hysteria Among Peary's Eskimo" (A. A. Brill), Journal of Nervous and Mental Disease, 1913, XL, 514-520; (abstract of paper and discussion, s. v.:) "Hystero-Epilepsy (Piblokto) among the Eskimos," ditto, 602-603.

10. Citation of an article in Russian as to psychoneuroses among the Yakuts, n Index Medicus, 1914: 1269.

11. "Psychoneuroses among Primitive Tribes" (I. H. Coriat), Journal of Abnorma Psychology, 1915-16, X, 201-208.

12. "Aboriginal Siberia, a Study in Social Anthropology" (M. A. Czaplicka), Oxford, 1914, pp. 307-325; and see pp. 169-170, 172, 198.

13. See the bibliography, pp. 331-351, which does not include her citations, pertinent hereto, from Journal Royal Anthropological Institute, XXIV, p. 223, (A. E. Crawley); "Hunting with the Eskimo," p. 67, (Whitney); 'Studies in Brown Humanity', pp. 186-201, (H. Clifford); "On Chorea and Choreiform Affections," pp. 2, 72-73, , (W. Osler.)

REVIEWS, BOOK NOTICES, REPRINTS, ETC.

Man—An Adaptive Mechanism.—By George W. Crile, F. A. C. S., Professor of Surgery, School of Medicine, Western Reserve University; Visiting Surgeon to The Lakeside Hospital, Cleveland. Edited by Annette Austin, A. B., and published by The Macmillan Company, New York.

The author, from knowledge acquired by extensive research carried out with the aid of a host of collaborators, discusses the functions and reciprocal relations of the various organs essential to life and their co-ordinative action in adapting the human organism to its environment, and traces its growth, evolution and survival from its conception, through the natural, as well as various accidental, vicissitudes in health and disease, to its death; from which one might well conclude that Herbert Spencer was not far wrong when he defined life as the "continuous adjustment of the internal relations to external relations."

The author writes:

"Man's special mechanism of adaption to environment is his nervous system, which co-ordinates each part of the body by means of the brain, the spinal cord and a labyrinthian network of nerve fibres and peripheral nerve-endings. Recent developments in the sciences of biology, physics, chemistry and physiology suggest that this nerve mechanism is merely a highly specialized pathway for the transmission of impulses set up by environmental stimuli. In higher beings these impulses meet and coordinate, or impinge and interfere in a central organ of the mechanism, the brain, where schemes or patterns of actions are formed automatically according to the lines of least resistance which have been established by the evolution of the organism and the species."

The work will be found both entertaining and instructive to those interested in the "final cause" of the biological processes which constitute man as a mechanism.

THE TREATMENT OF INFANTILE PARALYSIS.—By Robert W. Lovett, M. D., Boston; John B. and Buckminster Brown, Professor of Orthopedic Surgery, Harvard Medical School, etc., etc. Published by P. Blakiston's Son & Co., Philadelphia.

This is a clear and concise presentation of the various—and numerous—therapeutic measures applicable to the different stages or phases of this elusive disease.

Medical treatment of the active stage is necessarily unsettled, but the remaining paralysis or deformity presents an opportunity for the exhibition of the highest degree of judgment and resourcefulness, and the knowledge which may be obtained from this work should enable one to almost unerringly apply the proper treatment in the individual case. Though the title does not so indicate, there is a chapter covering pathology, symptoms, diagnosis and prognosis, besides the work contains 113 illuminating illustrations.

THREE CONTRIBUTIONS TO THE THEORY OF SEX.—By Prof. Dr. Sigmund Freud, LL. D., Vienna. Authorized translation by A. A. Brill, Ph. B., M.D., Lecturer in Psychoanalysis and Abnormal Psychology, New York University, etc.; with Introduction by James J. Putnam, M. D., Second revised and enlarged edition.

Published by the Nervous and Mental Disease Publishing Co., New York.

The primary object of this work evidently is the study of the sexual instinct and its aberrations through psychoanalytic investigation as indicated by the division of the work into the following chapters: The Sexual Aberrations; The Infantile Sexuality, and The Transformation of Puberty. However, the ultima thule apparently is to demonstrate the hypothesis that the functional psychoneuroses are always accompanied by some abnormality of sexual life,

i. e., "the neurosis is, so to speak, the negative of the perversion."

The author concludes the volume with the following observation:

"The unsatisfactory conclusions which have resulted from this investigation of the disturbances of the sexual life is due to the fact that we as yet know too little concerning the biological processes in which the nature of sexuality consists to form from our isolated examinations a satisfactory theory for the explanation of either the normal or the pathological."

Nevertheless, it is a valuable contribution to the Psychoanalytic movement.

THE HISTORY OF THE PSYCHOANALYTIC MOVEMENT.—By Prof. Dr. Sigmund Freud, LL. D., of Vienna, authorized English translation by A. A. Brill, Ph. B., M. D. Published by The Nervous and Mental Disease Pub. Co., New York.

A history of the discovery and founding of the theory of Psychoanalysis and of the reception accorded it in the various medical centers, with a recital of the vicissitudes incidental to its establishment—the common fate of innovations so startlingly novel. It is interesting and entertaining reading.

CENTRAL INDIANA HOSPITAL FOR THE INSANE.—Report from the Department of Pathology and the Department of Clinical Psychiatry, for the fiscal years 1913-1914 and 1914-1915.

An elaborate report—making a volume of 670 pages—of the excellent work being done at this institution, showing that it is fully abreast of the times in Psychiatry and allied branches.

THE ASSOCIATION OF LIFE INSURANCE PRESIDENTS.—Proceedings of the tenth annual meeting held in New York December 14th and 15th, 1916.

STUDY OF THE ORGAN INFERIORITY AND ITS PSYCHICAL COMPENSATION.—By Dr. Alfred Adler, of Vienna. Authorized translation by Smith Ely Jelliffe, M. D. The Nervous and Mental Disease Publishing Company, New York.

The trend of this work is to demonstrate that disease is due to an hereditary inferiority of the organ primarily involved which may be indicated by external stigmata connected with the system to which the inferior organ is related, and to show the effect of the reflection of this functionally inferior organ upon the organism, and especially upon the nervous system and the psyche, the compensatory action of which may cover the existing defect or, failing, result in a neurosis or psychosis.

PROGRESSIVE LENTICULAR DEGENERATION.—By Frederic J. Farnell, M.D., Providence, R. I., and Arthur M. Harrington, M.D., Howard, R. I. From the Clinico-pathological Department, Rhode Island State Hospital for Insane. From The Journal of Laboratory and Clinical Medicine, Vol. I, No. 8.

A complete case record with pathological findings, showing it to be a case of progressive lenticular degeneration of Wilson's type.

THE INFLUENCE OF THE NOSE ON EYE AFFECTIONS AS EVIDENCED BY A CASE OF BILATERAL BLINDNESS AND ONE OF UNILATERAL SCINTILLATING SCOTOMA CURED BY OPERATIONS ON THE ETHMOID CELLS.—By. H. W. Loeb, M.D., St. Louis. From the Annals of Otology, Rhinology and Laryngology, December, 1914.

CHRONIC INTESTINAL STASIS—Some Case Reports, Series I.—By Wm. Seaman Bainbridge, A. M., Sc. D., M. D., C. M., New York City. From The American Journal of Obstetrics and Diseases of Women and Children, Vol. LXXV, No. 2, 1917.

THE CHILD NATION.—Frederic Lyman Wells. From School and Society, Vol. IV, No. 91, September 23, 1916.

EXPERIMENTAL STUDIES OF INJECTION OF THE GASSERIAN GANGLION.—(Controlled by Fluoroscopy.)—By Lewis J. Pollock, M.D., and Hollis E. Potter, M.D., Chicago. From The Journal of the American Medical Association, Nov. 4, 1916, Vol. LXVII, pp. 1357-1359.

IMPORTANCE OF EARLY DIAGNOSIS AND PROPER TREATMENT IN INSANITY.—By B. R. McAllaster, M.D., Carthage, Mo. From the Journal of the Missouri State Medical Association, November, 1916, Vol. XIII, p. 525.

A NEW METHOD FOR INTRASPINOUS TREATMENT OF NEURAL SYPHILIS WITH MERCURY.—By Maurice F. Lautman, M.D., Hot Springs, Ark. From the New York Medical Journal for December 30, 1916.

THE SPHENOID SINUS.—A review of the past with suggestions for the future. Hanau W. Loeb, A.M., M.D., St. Louis. From the Journal of the American Medical Association, Dec. 30, 1916, Vol. LXVII, pp. 1991-1993.

CARDIAC CRISES IN TABES DORSALIS—Report of a Case With Sudden Death.—By Maurice F. Lautman, M.D., Hot Springs, Ark. From the Medical Record, October 21, 1916.

THE CAUSE OF THE ALLORHYTHMIC TYPE OF TREMOR IN PARALYSIS AGITANS.—By Lewis J. Pollock, M.D., Chicago. From The Journal of Nervous and Mental Disease, Vol. 44, No. 2, August, 1916.

PSYCHIATRIC FAMILY STUDIES.—By A. Myerson, M.D., Clinical Director and Pathologist, Taunton State Hospital. From American Journal of Insanity, Vol. LXXIII, No. 3, Jan., 1917.

THE DYNAMIC VALUE OF CONTENT.—E. Stanley Abbott, Waverley, Mass. From the Journal of Philosophy, Psychology and Scientific Methods, Vol. XIV, No. 2, January 18, 1917.

REPORT OF CASES OF CEREBROSPINAL SYPHILIS TREATED WITH SALVARSANIZED SERUM. From the Journal of the Missouri State Medical Association. Leo. Bartels, M.D., F. A. C. S., St. Louis.

ONE HUNDRED AND THIRD ANNUAL REPORT OF THE TRUSTEES OF THE MASSACHUSETTS GENERAL HOSPITAL, including the General Hospital in Boston, the McLean Hospital and the Convalescent Hospital in Waverley, 1916.

SEX GLAND IMPLANTATION, Additonal Cases and Conclusions to Date.—By G. Frank Lydston, M.D., Chicago. From Journal A. M. A., May 13, 1916.

FIFTEENTH BIENNIAL REPORT of the Superintendent of the Clarinda State Hospital at Clarinda, Ia., to the Board of Control of State Institutions, for period ending June 30, 1916.

DELAWARE STATE HOSPITAL.—Fourteenth Biennial Report of the Board of Trustees of the Delaware State Hospital, at Farnhurst, for 1915-1916.

KALAMAZOO STATE HOSPITAL.—Report of the Board of Trustees of the Kalamazoo (Mich.) Hospital for the Insane, for the Biennial period ending June 30, 1916.

THIRTIETH ANNUAL REPORT of the Board of Managers of the St. Lawrence State Hospital, Ogdensburg, N. Y., for the fiscal year ending June 30, 1916.

NEVADA HOSPITAL FOR MENTAL DISEASES.—Report of Superintendent for 1915-1916. John J. Sullivan, A. M., M. D., Superintendent, Carson City, Nevada.

VIRGINIA STATE EPILEPTIC COLONY, Madison Heights (Near Lynchburg), Virginia. Seventh Annual Report, 1916.

CONNECTICUT HOSPITAL FOR THE INSANE.—Report for the two years ended September 30, 1916.

DEMENTIA PRECOX STUDIES.—The Origin of Toxic Substances in the Body and a Method of Extruding Them. By Bayard Holmes, M. D., Chicago, Ills. From Medical Council, Feb., 1917.

DYSMENORRHEA.—By Grandison D. Royston, M.D., St. Louis. From The Journal of the Missouri State Medical Association, October, 1916, Vol. XIII, p. 495.

A NEW MERCURIAL PREPARATION IN THE TREATMENT OF SYPHILIS.—By Maurice F. Lautman, M.D., Hot Springs, Ark. From the Medical Record, January 13, 1917.

MENTAL REGRESSION: ITS CONCEPTION AND TYPES.—By Frederic Lyman Wells, Ph. D., McLean Hospital, Waverley, Mass. From the "Psychiatric Bulletin," October, 1916.

SECOND ANNUAL REPORT OF THE NATIONAL COMMITTEE FOR THE PREVENTION OF BLINDNESS, November, 1916.

ALIENIST AND NEUROLOGIST

Vol. XXXVIII. St. Louis, May, 1917. No. 2.

HEAVENLY BRIDEGROOMS*

By Theodore Schroeder
and Ida C.

"The Sons of God saw the daughters of men that they
were fair; and they took them wives of all that
they chose."
Genesis 6:2.

The Mohammedan Idea of the Evil Church Yard Lilith Crops Up in Ireland

THE ancient Churchyard of Truagh, county Monaghan, is said to be haunted by an evil spirit, whose appearance generally forebodes death. The legend runs, writes Lady Wilde (Ancient Cures, Charms and Usages of Ireland, p. 84), "that at funerals the spirit watches for the person who remains last in the graveyard. If it be a young man who is there alone, the spirit takes the form of a beautiful young girl, inspires him with ardent passion, and exacts from him a promise that he will meet her that day month in the churchyard. The promise is then sealed by a kiss, which sends a fatal fire through his veins, so that he is unable to resist her caresses, and makes the promise required. Then she disappears, and the young man proceeds homewards; but no sooner has he passed the boundary wall of the churchyard than the whole story of the evil rushes on his mind, and he knows that he has sold himself, soul and body, for a demon's kiss. Then terror and dismay take hold of him, till despair becomes insanity, and on the very day month fixed for the meeting with the demon bride, the victim dies the death of a raving lunatic, and is laid in the fatal graveyard of Truagh." (T. F. Thiselton Dyer's "The Ghost World," 344-345.)

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*Continued from November, 1916.

In Capt. Richard F. Burton's translation of the Arabian Nights occurs a story of a female desert-monster, called Ghulah, who devours human flesh. Captain Burton, in a footnote, remarks:

"The Ghulah (fem. of Ghul) is the Hebrew Lilith or Lilis; the classical Lamia; the Hindu Yogini and Dakini; the Chaldean Utug and Gigim (desert-demons) as opposed to the Mas (hill-demon) and Telal (who steal into towns); the Ogress of our tales and the Bala yaga (Granny-witch) of Russian folklore. Etymologically 'Ghul' is a calamity, a panic fear; and the monster is evidently the embodied horror of the grave and the graveyard."

In its more usual spelling of "Ghoul," this graveyard monster will probably be familiar to most readers.

"The female Ghul * * * * appears to men in the deserts, in various forms, converses with them, and sometimes prostitutes herself to them * * * *

Here we see the (1) spirit bride, degraded to the level of a harlot, (2) vague and unreasoning terror, (3) loathing and horror of the spirits of the deceased all meeting under one name. So far has Lilith, the Borderland bride, fallen from her rightful estate by reason of the befogged imaginations of mankind.

"The Shiqq is another demoniacal creature, having the form of a half human being (like a man divided longitudinally) and it is believed that the Nasnas is the offspring of a Shiqq and a human being * * * * The Nasnas is described as having half a head, half a body, one arm, and one leg, with which it hops with much agility." (A Dictionary of Islam [article Genii] by Thos. Patrick Hughes.)

This is another form of the giant progeny of Borderland unions—a form so fantastic as to show that its origin is a subjective hallucination, and not an objective reality. In other words, the Mohammedan, Shiqq and Nasnas are both of them probably the subliminal invention of some imperfect earthly psychic in the centuries agone, who broke the Borderland law in his or her relations with a spirit bride, or a spirit husband and who was grossly misled. in consequence, by his or her own subliminal self. That others since then claim from time to time to see these fantastic creatures does not prove that they exist. In psychical matters nothing is more common than for people to see ghosts at a given time and place when their imaginations have been worked up to the expectation of seeing one then and there, of a certain predetermined type.

The Mohammedan Paradise as well as its Borderland recognizes love between the sexes. And in this it differs from the Christian Paradise as popularly conceived—although as I have elsewhere shown, the statement by Jesus that we shall be after death, as regards marrying, like "the angels in heaven," when taken in connection with the next in Genesis about the sons of God who wedded earthly women, shows pretty conclusively that the Christian Scriptures admit the existence of sex and marriage in the world beyond the grave. Nevertheless, the Church has chosen to flatly contradict the teaching of both the Old and the New Testament in this, with the result of blinding Christians utterly to these potent Scriptural truths. Mohammed, on the other hand, was sufficient of a seer to venture on restoring the ancient doctrine.

Heaven, as is well known, abounds in love-making, beautiful women called Houris attending upon the risen soul of the male Mohammedan as he reclines at feast. It is true that apologists have suggested a figurative sense in which the accounts of Mohammed's Paradise are to be taken.

On the contrary, it is not at all remarkable. It was precisely because Mohammed was at that time living a fairly well ordered and self-controlled life, that he was enabled to learn sufficient of the world beyond the grave to assert that love between the sexes survives death and is one of the potent factors in social life there, as here. It is true that, being an Oriental, his "revelations" would inevitably conform to his cast of mind, so that the glitter and luxurious abandon of a feast presided over by Houris might seem to him the acme of ideal bliss. But beneath and permeating all this voluptuous imagining breathes the mighty truth of sex-love in Paradise.

That love which mutually strengthens and mutually uplifts as no other love in all the world can strengthen and uplift. I take it is the chief reason for its existence—the propagation of the species being of necessity incidental, therefore, secondary. But there is, also, a third reason which, unfortunately, is known to but few. Nor is it likely to be understood as it should be. The third reason for the marital union is that for those who are worthy, it is whether on the Borderland or the earthly plane, the surest and safest method of seeking union with the Divine Heart of the Universe and becoming one with all God's world. Only in giving joyful thanks to God, indeed, should that relation ever be entered upon. This, not only because it is fitting to give thanks to God, but because it is beautiful at that time, and because only those who have experienced the bliss of taking God into the marital partnership in its most intimate relation can be said either to be truly wedded or to truly realize what it is to love God and be in return beloved by Him. This applies in earthly as well as Borderland wedlock.

Trite and commonplace as may seem this suggestion to give thanks to God in this relation and share one's joy with Him, it nevertheless appears to be the inner, sacred truth of all religions on their esoteric side, and of all mysticisms and forms of occult teaching, the world over—a truth which has been jealously hidden away from the masses. It has been concealed for several reasons, probably.

First, it is not a matter to be attained at once, but requires systematic and careful training in self-control. And some degree of intellectual and spiritual insight is necessary to rate this training at its just value, as well as to respect the sacredness of the idea which underlies it. There are three degrees to be passed in this training, of which I will speak later on.

Second, inasmuch as it enhances, instead of extinguishing, connubial pleasure, while at the same time it puts the begetting of children absolutely under the control of parents, and this, without violation of either civil or natural laws, its initiates evidently feared lest it be turned to base uses by the unscrupulous and licentious. A needless fear, this, however; as to the libertine, the game will never seem worth the candle; while, should he persevere in the training so as to become an adept in the third and last degree, he will be no longer a libertine.

Third. There is a belief among some occultists that an earnest wish breathed at that time, when husband and wife are one, it will not fail to be granted. This opens, it is said, the door to those who practice what is called "black magic," and enables them to work harm upon other human beings. What foundation there is for this belief as applied to the magicians I do not see. If it really be that a wish is granted then more readily than when the seeker is in any other mood, it is probably because the occultist who attains the second degree has to exercise such supreme self-control at that moment that he is complete master of his sub-consciousness, and if he has attained the third degree he is in rapport with Spirit throughout the universe, so that his desire is granted because he desires only what is in harmony with Good and Right. That a black magician should be able at such a moment to enter upon harmonious relations with the universe by breathing a curse, seems to me very unlikely. I am of the opinion that this belief is due to the mistaken idea that correct living and clear thinking are unnecessary to establish lines of accurate communication with the unseen world. And, because occultists have usually assumed the nearness of a world of devils, rather than of a world of angels, and because they have assumed that depravity and prejudice offer no bar to communication with the unseen, whether good or evil, it was a most natural conclusion that it would be dangerous to entrust the secret of the third degree to a "black magician." But, so long as a man is a black magician, he will fail to enter upon the third degree. This last degree is, I am firmly convinced, impossible, whether in earthly or Borderland wedlock, for either man or woman who does not live a pure life in self-control and aspiration to the Divine. And the occultist who seeks to attain to the third degree must first become a white magician.

Nevertheless, as I have said, the initiates in the third degree have guarded this secret most jealously, and apparently for the reasons I have assigned.

The first and second degree, however, seem to have been taught publicity in symbolic rites—such as for instance in that much misunderstood dance at the Columbian Exposition—the Danse du Ventre. It was noticeable that the Oriental men, one and all, viewed that dance with serious and at times reverant gaze. This fact was brought to my notice by two ladies (school teachers) who knew absolutely nothing of the Sex Worship symbolism of the dance, but who had concluded, simply from thoughtful observation, that there must be some religious and pure-minded motif back of it all. Nevertheless, most Americans and Europeans, whether men or women, failed to penetrate beneath the surface of this markedly symbolic dance, owing to the occidental habit of thought which sees naught but impurity in the most important and sacred function of our nature. In Oriental countries, however, despite their being "heathen" sex is looked on as holy; in this connection, our phrase, "Give God the glory," takes on itself a vaster significance than is ever taught from our pulpits.

It is no wonder, then, the Oriental occultists should have penetrated at an early date to the underlying principles of marital relations on the Borderland. From their lifelong habits of thought, they viewed sex as simply and naturally as we should view the circulation of our own blood—as a curious phenomenon of absorbing personal interest. With no false shame to overcome, they were fitted to receive the higher truths concerning this subject, whereas our Occidental mediums, for the most part, receive words of impurity or are misled into a loose life. The difference is due to the exact antipodal standpoints of Occidental and Oriental psychics on the subject of the holiness of sex.

I have said that the initiates of the third degree seem to have made this the inner secret of their mysteries, the world over and, that they have always jealously guarded this secret from the masses. I am inclined to think that in the beginning it may not have been so, but that this jealous care may have been the result of a bitter lesson learned of the unwisdom of throwing pearls before swine, not because the swine turn and rend one—for the earnest teacher of truth never gives his own danger a second thought—but because the swine are too apt to soil the pearls by trampling them in the mire.

If it be asked in amazement, how this teaching of "Giving God the Glory" and sharing with Him the supreme joy of the marital relation could become so degraded by swinish human beings as to cause its teachers to withhold it in future from the masses, I answer:

By turning it into a commercial transaction with God.

The piggish, greedy man, learning by hearsay of the connubial bliss attending the Triune partnership with God, pressed eagerly forward with one thought uppermost: "I will pay God cash down for so much of my pleasure, and I mean to drive a close bargain with him."

The voluptuary, seeking to enhance his physical sensations, likewise pressed forward, saying to himself in an outburst of generosity: "God shall receive from me every whit as much as He gives me."

The sentimental, but selfish mystic, ever yearning for a new subjective experience, likewise pressed forward, thinking, "I shall get acquainted with God on intimate terms by dividing up my pleasure with Him."

Be not deceived: God is not mocked: Whatsoever a man soweth he shall reap. And each of these types failed to get what they expected in pleasure, because it cannot be secured by any means but by love.

Now, these would-be initiates not only failed (to get so much physical pleasure for so much tithing paid over to Him), but they tempted by that very failure to enter upon what we may call (to put it euphemistically) a bargain.

The nervous system had been wrought to too high a pitch not to insist upon a purchase in some market—if not in God's market, then in the Devil's. Hence, I fancy too often abnormal vices and abominations of ancient Sodom and Gomorrah of the 'Orient today and the Roman Empire, when Christianity first turned its purifying (though salty) current through the Augean stables of latter-day sex-worship.

For this the initiates who held the whole truth, among other reasons no doubt, usually shrank from revealing even glimpses of it to any one who had not passed a long probation. According to the Talmud, the ancient Hebrews had three names to express the idea of God, the first of which was interdicted to the great number. Sages taught it once a week to their sons and their disciples. The second was at first taught to everybody. "But," said Maimonides "when the number of the ungodly had increased, it was intrusted only to the most discreet among the priests, and they repeated it in a low tone to their brethren, while the people were receiving the benediction." The third name for God "contained", says Jacolliot, "the great secret of the universal soul, and stood for, if we may so express it, the highest degree of initiation." Regarding this last, Maimonides says:

"It was only taught to a man of recognized discretion, of mature age, not addicted to anger or intemperance, a stranger to vanity, and gentle and pleasant to all with whom he was brought in contact."

" 'Whoever,' says the Talmud, 'has been made acquainted with this secret and vigilantly keeps it in a pure heart, may reckon upon the love of God and the favor of men; his name inspires respect; his knowledge is in no danger of being forgotten, and he is the heir to two worlds, that in which we live and the world to come.' " (Franck's "La Kabbale.")

All of which applies to the earthly partner of a celestial bride or bridegroom, when the laws of correct living and clear thinking are obeyed. Those who know this secret and vigilantly keep it in a pure heart are indeed the heir of both worlds, for they dwell upon the Borderland, harmoniously adapting their lives to both planes of existence and, being at one with God, they can each say, "If God be for me, who can be against me?" Nor is the reward for making a proper use of this Great Secret confined to Borderland wedlock; its Kingdom may come on the earthly plane itself to worthy neophytes.

It was probably to keep the knowledge of this secret from the unworthy, that the ancient mysteries of Isis and of Eleusis were designed. For this purpose, also, the sacred scriptures of all religions—not excepting the Hebrew and the Christian—seem to have introduced stories and aphorisms which should convey one meaning to an outsider, and quite another to an initiate.

"Woe to the man, who looks upon the law as a simple record of events expressed in ordinary language, for, if really that is all it contains, we can frame a law much more worthy of admiration. If we are to regard the ordinary meaning of the words, we need only turn to human laws and we shall often meet with a greater degree of elevation * * * * Every word of the law contains a deep and sublime mystery." (A. Franck's "La Kabbale.")

"If the law were composed of words alone, such as the words of Esau, Hagar, Laban, and others, or those which were uttered by Balaam's ass or by Balaam himself, then why should it be called the law of truth, the perfect law, the faithful witness of God himself? Why should the sages esteem it as more valuable than gold or precious stones?

"But every word contains a higher meaning; every test teaches something besides the events which it seems to describe. This superior law is the more sacred, it is the real law." (Jewish Cabalists, quoted by Jacolliot Oc. Sci.)

The following occurs in the Book of the Pitris (Pitris, according to Jacolliot, is the name applied in India to the spirits of the dead) with whom communication has long been held, after the fashion of modern Spiritualism, and with the same attendant phenomena.

"The sacred scriptures ought not to be taken in their apparent meaning, as in the case of ordinary books. Of what use would it be to forbid their revelation to the profane if their secret meaning were contained in the literal sense of the language usually employed?

"As the soul is contained in the body,

"As the almond is hidden by the envelope.

"As the sun is veiled by clouds,

"As the garments hide the body from view,

"As the egg is contained in the shell,

"And as the germ rests within the interior of the seed,

"So the sacred law has its body, its envelope, its cloud, its garment, its shell, which hide it from the knowledge of the world. * * * *

"You who, in your pride, would read the sacred scriptures without the Guru's assistance, do you even know by what letter of a word you ought to begin to read them—do you know the secret of the combination by twos and threes—do you know when the final letter becomes an initial and the initial becomes final?

"Woe to him who would penetrate the real meaning of things before his head is white and he needs a cane to guide his steps." (Quoted by Jacolliot Oc. in India.)

The closing paragraph becomes significant, when we reflect upon the danger which the initiates feared would accrue to those still in the heyday of manhood's passions, if they proved unworthy of the Great Secret. The expression "The secret of the combination by twos and threes" has probably a double meaning here—the esoteric meaning turning upon the two kinds of marital partnership; known to the initiates; husband and wife being the "combination by two" (in the second degree); and husband, wife and God, three in one, a sacred trinity in unity, being the "combination by three" (in the third and highest degree), and they who have once realized the blessedness of this triune partnership, will move heaven and earth to make it renewable at will—so much sweeter and more helpful in every way is it than the mere "combination by two."

Now, because sex is distinctly emotional in its manifestations, there is always a tendency, with failure to reach the highest, to allow the emotions to slump down, as it were, to a lower level. Few natures are so supremely self-controlled as to say, at a critical moment, "the highest—or nothing. I will wait for that! And so, the types I have mentioned above as failure, the piggish man, the voluptuary and the sentimental, selfish mystic—when, because of the delicate balance required of the initiate who would enter on the third degree, they slipped off their pivot, fell quite outside the circle of what is lawful, sure and normal, to chaotic, unlawful and horribly vile. From this, dates much of the black magic. And this was the controlling subjective influence which made witchcraft a very real, objective terror to the victims of the witches during the Middle Ages. There is little doubt that many of the witches did practice a sorcery of the most diabolical type—a sorcery based upon the principles of hypnotic suggestion, and of the willful projection of the astral or double; a sorcery, whose object was to cause evil, and which did cause evil in many cases where the victims were not protected from occult mischief—working by living pure and upright lives; a sorcery, finally, whose impelling motive was due to insane hallucinations resulting in a very large number of cases from having violated the laws of right living in sex relations on the Borderland. It is probable that many of these witches passed the second degree, while few, if any, gained the third —the inner degree where aspiration in mingled purity and passion to union with God is chief factor. Some of the attributes of a witch (we need not enumerate them all: the literature of the subject is voluminous) were: 1st, that she sustained or was supposed to sustain occult sex relations with the Prince of the Powers of the Air, Yclept the Devil.

2. That she received on some part of her body a devil's mark or stigma, which was his seal of authority over her and which seems to have been hypnotically rendered insensible to pain. There were men, who did a business in discovering witches by pricking a suspected woman's body all over with a pin until they found some place insensible to the pain of the prick, when they would triumphantly announce this to be the "Devil's Mark;"

3. That the Devil or one of his imps at times visited her in the guise of some animal—a dog, a cat, even a huge butterfly, to suck some part of her body, and that, whatever the part of her body chosen, it and no other spot was always resorted to by the impish creature thereafter Sometimes

witnesses testify to seeing these animals familiar as in the case of a witch ill in bed who was being closely watched. The witness, who was on guard testified with much detail of circumstance, to having seen a huge "fly," like a miller, which buzzed in among the hair of the sick woman and after a while flew away, when the witch called to the witness to lift up her hair, that she might show a sore place on the scalp which she said, was where the Devil, in the form of a fly, was wont to suck her.

4. That she could work harm to people at a distance by what appears to have been hypnotic suggestion and that she usually was wickedly and viciously inclined to do this, at will.

5. That she could appear in what seems to have been her double, or astral form, to her victims.

Now, regarding this last, the extremely critical and level-headed Society for Psychical Research have collected some three thousand cases of apparitions of living doubles at the present day, all of them well attested by witnesses. Most of these apparitions (some of which were so like real flesh and blood as to be taken for the person himself) according to the Society's records, were spontaneous, only a few being deliberately self-induced—a fact which indicates that the projection of the double is probably a normal power and that it ought to be, therefore, not so very difficult for an illiterate old woman to acquire. A few apparitions of doubles seem to be due mostly to one of the following causes:

1. Violent shock, as a runaway accident, danger of drowning.

2. A state of health indicative of approaching death, so that the astral form (is this the soul, the body of the immortal spirit?) seems already poised for flight.

3. The moment of separation of soul and body, especially if caused by drowning, suffocation, contusion on the head, wounds received in battle, etc.

4. Falling into "a brown study": gazing fixedly at an object in an abstracted way (self-hypnotization); listening abstractedly to a continuous and monotonous sound.

5. Falling asleep with an earnest desire fixed in one's mind to visit such or such a person or place.

Any of these may be induced accidentally and, so far as we know, without the conscious will of the ego.

6. Deliberately willing, under some of the above circumstances, to have one's double appear at such and such a place. This act may or may not include—according to the extent of the psychic's training—an after memory of the event.

From the above it will be seen that the apparition of the double, whether spontaneously or deliberately induced, seems to be brought about by a sudden focusing of mental force. I am inclined to think that some of the surest vouchers for the material objective substantiality of the world beyond the grave will be found among the phenomena attending the appearance of the double; inasmuch as the double, when most clearly manifesting, comforts itself like an earthly being, with earthly necessities, and if this double be, as appears, identical with the soul-body which quits our mortal frame at death, we have only to collate and compare instances of the earthly double, and acquire the art of projecting our own double intelligently and without loss of memory while in earth-life, and we shall know beyond all doubt what its habits of thought, its appetites and necessities are likely to be beyond the grave.

In the witchcraft days, what is called repercussion was a common phenomenon. That is, the witch who appeared in astral form to her victims, if wounded with a knife, might be afterwards found to have sustained a similar wound in her physical body. This carries out the idea of the Theosophists and other occultists, that thought has power over matter, and that our physical frame is in reality moulded by the spirit and soul which inhabit it. Col. Olcott gives an interesting account of repercussion in his own case.

Instances are not wanting where the earthly double has shown that its sex capacity remains apparently unaffected by temporary separation from the body. The following case, though probably founded on the falsehood of a clever woman (S. V. Fécondité), shows with what serious respect the phenomenon of the double was viewed some three hundred and fifty years ago.

In the "Dictionaire Infernal," there is a report of a trial before the Parliament of Grenoble, in which the question was, whether a certain infant could be declared legitimate which was born after the husband had been absent from his wife four years. The wife asserted that the baby was the offspring of a dream, in which she had a vivid idea that her wandering spouse had returned to love and duty. Midwives and physicians were consulted, and reported on the subject. As a result, the Parliament ordained that the infant should be adjudged legitimate, and its mother should be regarded as a true and honourable wife. The judgment bears date 13th of February, 1537. (Inmen's "Ancient Faiths and Modern," p. 285, footnote.)

The following incident was told to me by a gentleman who had heard it from the lips of one of the parties. For obvious reasons, I suppress localities:

"A gentleman who was intensely dark, of a Spanish type, was in love with a girl of the true blonde type. They never married but later on she married someone else and moved to another part of the country. One night this gentleman had a very vivid dream, in which he fancied himself to be her husband. So real seemed the experience that he could scarcely convince himself on waking, that he had not actually just come from her presence. Several years later, he happened to be in that part of the country, and bethought himself of hunting up his former lady love. He found her husband to be a decided blonde, like herself. A little child, a decided brunette, ran up to him, exclaiming joyfully, "Papa, Papa!" "Well!" laughed the host, "I am glad that she has found someone to call "Papa", for she steadfastly refuses to recognize me as such." Whereupon the lady appropriately fainted. The visitor learned afterwards by making inquiries of her, that she had had a dream similar to his at the same time, and just nine months previous to the birth of the child."

Was this a case of repercussion? Did his double meet her double (but not hér physical self) on the astral plane and was that thought-world more powerful in moulding her child than was her physical environment as a wife? Or was it merely a telepathic impression conveyed from his mind to hers with sufficient vividness to "mark" the child? I may here remark, that I do not consider the theory that he was the physical father of the child, as it seems to me that that would be a violation of the natural laws of Borderland. Nevertheless, if he really was the physical father, the stories would only be in keeping with the stories of the giant progeny from angelic fathers, and the stories of women confined in high towers and yet becoming pregnant by a celestial visitor. In the case of Danae, her visitor materialized as a shower of gold—quite after the fashion of modern apparitions of spiritualistic seances where the spirits often materialize as floating masses of radiant mist. At recent seances, too, trained scientific observers have perceived the medium's double (I now speak of mediums who are not fraudulent and who are willing to submit to experimental tests) partially or wholly dissociated from the medium's physical self. Col. Olcott gives an interesting account of his double oozing through the walls of Mrs. Blavatsky's room on its way to the sitting-room to add three words to a MS. on which he had been busily writing just before retiring. Both the earthly double and the celestial spirit appear to possess this faculty of oozing through blank walls. May they not be one and the same? In that case, we see how easy it may be to confound spirit bridegrooms from the world beyond the grave (who cannot beget children on the Borderland because this would be a violation of natural law), and astral doubles of earthly lovers who can stimulate the begetting of children upon the astral double of an earthly woman so vividly as to mark the child of her lawful husband and herself with the likeness of the astral lover.

At this point it may be objected that such information as I am here giving should not be spread broadcast, lest unscrupulous libertines take advantage of this power of projecting the double to get innocent girls into their power, since high towers and bolted doors appear to offer no barrier to the double's entrance. It is precisely for this reason that this information should be widely circulated, in order that these possibilities may be made known to the general public and guarded against. The present flood of Theosophic and other popular occult literature as well as the published records of the S. P. R. have already placed the knowledge of this power within the reach of the libertine, if he chooses to avail himself of it. When he can have this for the asking, it is high time that the general public know something of it also, as well as of the fact that correct living and clear thinking will always protect us from evil induced by occult means. It is an interesting question, however, as to whether children could really be begotten by a double upon a virgin, or, as in the case tried before the Grenoble parliament upon a married woman whose husband is away; I am inclined to think not, since the double is for the time being on a different plane of matter from the physical body of the woman, being, in fact, in the same world as it will be after death; so that it must obey the law of the Borderland quite as much as if it were an angelic bridegroom, which it to sow no seed, inasmuch as no harvest can be reaped therefrom. But in this case, what becomes of the scientific basis of such stories as Danae and other virgins who become the mothers of children by a Borderland lover—whether earthly double or heavenly angel? There is but one way so far as I see, by which a Borderland bridegroom could beget a child by an earthly woman. The woman must live each moment in strict obedience to the laws of her earth-life and also of his heavenly life. She must be capable of appreciating the intellectual thought of his advanced world. She must understand and live in accordance with the higher code of ethics current in his realm. She must neglect no earthly duty; she must be conversant with the intellectual thought-world of her earthly associates; she must not crush out a single instinct of her nature but properly use every physical appetite and passion to round out a symmetrical earthly life. When emergencies arise on either the earthly plane or on the Borderland, she must never make a mistake, for to do so, will cause the lines of communication to waver and presently to part. In short, her life, judged not only by the highest earthly standing but by the more advanced standard in the world beyond the grave, must be absolutely perfect, if she is to conceive, gestate for nine long months and give birth to a child begotten by a Borderland father, that is, she must be psychically on the same plane with him, and at the same time fulfill the laws of both planes and that without a single break. Only thus were the laws on the Borderland obeyed.

The Roman Catholic Church in its dogma of The Immaculate Conception, claims perfection for the blessed Virgin Mary. In so doing, it shows its wisdom. Though I am by no means a Romanist, I emphatically say, that from the occult standpoint, the immaculate life of Mary for a long period prior to the Annunciation and until at least the birth of Jesus, is the only foundation upon which the possibility of the mysterious conception of Jesus as a Borderland child can rest. Having once attained this high plane, it is unlikely that she would ever descend to a lower plane afterward: so that, accurately speaking, the Roman Catholic doctrine of her immaculate life must have been absolutely perfect on all points, or she could not have conceived a child by the spirit of God; for God does not break his own laws. Nor is it likely that the heavenly bridegroom would break his laws in order to beget a child upon an earthly woman provided that woman were suitably trained for sometime for the occult espousal, and provided that God has a tangible form, as He appeared to Moses to have when he had Moses remain in the cleft of a rock while he passed by. (Exodus XXXIII, 21, 23.) This is the strength of the one Catholic doctrine concerning Mary's stainlessness of life; and from the Apocryphal Gospels, it appears that Mary had had the advantage of being brought up as an orphan in the temple under the eyes of the priests. It was customary for her to see and talk with angels and to receive food from them before her espousal to Joseph. My own idea of it, however, is that such a conception—if conception there were—would require Mary's mentality to rise not only to the standard of an angel but to the omniscience and all pervading tenderness of God, in order for her to be so thoroughly his spouse on the Borderland as to conceive and bear a child to him * * * * On the other hand, it is interesting to note in connection with this, the record in the Apocryphal Gospels as to the appearance of an angel visitor to Mary in the guise of a handsome youth, and the opinion expressed to Joseph by the virgins left in charge of her during Joseph's absence, that it was the angel who had made her pregnant.

Perhaps when we come into harmonious rapport with the mystical theory, popularized by the school of divine science and other mystics, that each one of us is a part of the universal mind, and that that mind may know all things in the universe we might allow even this on the Borderland. However, the Roman Catholic Church has seemingly provided for the high standard of mentality required from a spouse of Divine Science on the Borderland by ascribing to Mary not only the name, but the attributes of "Mother of God."

In "The perfect way, or the Finding of Christ," written by Anna Kingsford and Edward Maitland, occurs a remark about "the notion far from uncommon, that by abjuring the ordinary marriage relation, and devoting herself wholly to her astral associate, a woman may, in the most literal sense become an immaculate mother of Christs." It is needless to add that the authors deprecate this, but their remarks show their total misapprehension of Borderland sex-relations, since it is only between husband and wife that those relations can exist objectively, all else is but subjective illusion. And, therefore, the command of Mary's Heavenly Bridegroom that Joseph was not to approach her as a husband until after the birth of the mysteriously begotten child would be strictly in keeping with Borderland laws, because it is the highest ideal of both worlds.

The mediaeval witch, as well as the Blessed Virgin, had her chance of Borderland nuptials on a high plane; but, unlike Mary, she failed to pass those ordeals which require correct living and clear thinking on the part of the earthly psychic. In the first place, the witch (poor woman) lived in days when the physiological relations of husband and wife occupied a far lower place in popular estimation than it did in the days of Mary, and moreover, in the Orient, Mary's home, the relation of husband and wife had then and still has, a holiness on its physiological side which is foreign to European or American habits of thought. When the peculiar psychical experiences of the witch set in, therefore, she naturally jumped to the conclusion that, first they were sinful; second, that, being sinful, they were the work of Satan. These assumptions were a departure from clear, unprejudiced thinking, and from that moment began her diabolical illusions, and she saw monsters, hobnobbed with imps, was lashed by scorpions, etc., etc., to the full extent of her willingness to receive these illusions as objective realities. The poor creatures indeed, had not our advantages in the perusal of records of hypnotism and of the Society for Psychical Research, and would have been sadly puzzled to draw the line between subjective illusion and objective materialization. Nevertheless, her angel lover was with her when she thought him the Devil. He comforted her in her poverty and loneliness (many of these witches, remember, were old women, whose lives had been the bare, dreary, lives of the terrible poor) and he promised her such influence among her neighbors as she longed for most. This was an ordeal, had she but known it, which, if passed successfully, would have brought her a higher and sweeter pleasure. Some there were, here and there, who seem to have chosen the better part, and to have become "white witches," capable of clairvoyance, of healing human beings and cattle of strange diseases, forecasting the future and the like. But usually, these poor old women had been so embittered against selfish or heedless neighbors, that the influence they longed for most was to pay back their wrongs (real or supposed) with interest. Here again, they broke the occult law which calls for correct living on the part of the psychic, and trod the downward path of hatred and diabolism. In many cases, no doubt the psychical experiences of a witch started from this fierce desire to be revenged upon those who had slighted her. She probably began with some simple form of self-hypnotization imparted to her by a neighbor who had already acquired some proficiency in the art. Once she had accomplished this, the astral world lay open wide before her with all its illusions or all its realities, according to how she proved worthy of one or the other. Sometimes, no doubt, she struggled upward to benevolent thoughts and prayers for help in resisting temptation and was accordingly rewarded with true occult power and with union with her angelic mate who was both her husband and her guardian. That she thought him the Devil, partially interfered with the physical strengthening and psychical happiness which that union brought; while he, on his part, kept steady watch over her infirmities, always ready to help the slightest impulse of her spirit to rise to higher things, seeing as only angels see, beneath that misshapen earthly body, the soul, the astral body, which, despite the temporary disfigurements caused by evil thoughts, is ever young and fair, and waiting patiently throughout her poor, stumbling, sinful life, as only a man who truly loves a wife can wait, for the time when she will live down her mistakes, and see as clearly as himself.

If it be objected that this occult wedlock with an angel whom she ignorantly mistook for a Devil, brought her misfortune, I answer: Not unless she broke the law of correct living by trying to turn her occult powers to base purposes, or failed to keep clear-headed.

But in that case?

In that case, also, her guardian angel took her through the deep waters and along the rugged, toilsome mountain path for her evolution, that she might be made perfect through suffering. Are we not all convinced that that is what God means by putting us, who are not witches, in a world where each of us has to wrestle with adverse circumstances in betterness of spirit? In our inmost being we recognize God's wisdom in our being taken through sorrows, temptations and conflicts, for thus only can we grow strong and rise to our full stature as made in His likeness. And to the witch, Heaven was no less merciful than to us, in that it forced ordeals upon her which, when she passed them, brought her happiness, but which, when she failed to pass them, brought her suffering.

It is noticeable that most of the witches who came to grief, and who confessed to intercourse with the Devil, referred to certain ceremonies customary at each "Sabbath" although records of witchcraft point rather to subjective illusion of performing abominable rites, which symbolized abnormal vices. For details, the reader may refer to almost any work on witchcraft. He will there see, that with all the fuss made by the judges and persecutors about this intercourse with Satan, there was very little of real impurity, and what there was, seems to have been entirely subjective—the illusion of an insane imagining. In short, the witch, as well as other brides of angelic lovers, was evidently far from impure-minded by nature at the start, and this, too, in an age of vulgar expressions, coarse ideas and from which even the genius of a Shakspeare did not escape without contamination. Yet these women were mostly illiterate and miserably poor. It is probable that their poverty, however, had been their educator in ascetic deprivation and in bearing up under slights from more fortunate neighbors, and so had laid the foundations of that stern control of self which is absolutely necessary in the true occultist. That this feature—their feelings under slights received from neighbors—played an important part in their thoughts and consequently in their development, is shown by the fact that many of their attempts (real or supposed) at bewitching, date from an unkind refusal of a neighbor to give them a bowl of soup or an old shirt. Ill-temper, then, morose broodings over wrongs, general sourness of spirit, were not the least important of the causes which turned those earthly partners of angelic bridegrooms into devil-handed witches.

Another cause seems to have been their failure to think clearly and without prejudice. Poor creatures! They were nearly all of them prejudiced (i. e., "pre-judgers") from beginning to end. They pre-judged angels to be the

Devil; they pre-judged the monsters imagined by their own sub-consciousness to be real; they pre-judged the wedlock into which they entered on the Borderland to be sinful; they pre-judged their mysterious visitor to be a tempter to lead them away from religion and the church; they pre-judged him as requiring unhallowed rites—dimly remembered survivals from the ancient Sex Worship, too often on its vilest side; they pre-judged him, as the means of ignoble satisfactions of their hatred and their animal desires. And thus they sank to diabolism.

There was yet another cause—not so much of evil as of illusions. This was the "Devil's mark" that special mark of his with which they supposed themselves stamped on some part of their bodies. With this, we may classify the spot at which the Devil or one of his imps was said to suck them, and also the peculiarity that their bridegroom in his marital relations, chilled them as though with ice.

There are many phases of occult sensitiveness. The ear for the clairaudient, the eye for the clairvoyant, the easily swayed arm and hand for the writing medium, are the three physical organs through which communications usually reach us. But for the wife of a heavenly bridegroom, the nerves of touch, it is evident, must be the chief focuses of occult sensitiveness. Now, in order that the delicate balance of nerve sensation be maintained, it is important that such a psychic distinguish readily between real touches and illusory touches, between objective realities impinging upon the ends of her nerves and hypnotic suggestions, either self-induced or induced by an outside intelligence, say by her spirit bridegroom. And not only must she learn to distinguish thus between real and unreal sensations, but she must also learn to resist all hypnotic suggestion to feel sensations which do not exist or which are unlawful. No psychic can be considered thoroughly self-controlled who has not acquired this power of resistance to hypnotic suggestion of unlawful touches or of unreal things as real. No psychic's testimony can be considered reliable so long as she fails to distinguish between genuine and illusory touches. So long as she is lacking in any of these essentials to the wife of a heavenly bridegroom, just so long will her guardian persist in putting her through a course of training—a training which she must undergo until she passes her examination and is promoted into a higher class, there to take up still more advanced lessons in psychic discrimination and psychic self-control.

Now, the "Devil's Marks" and the "sucking" were both, so I hold, illusory sensations which the witch failed either to classify or to conquer, but to which she mistakenly succummbed. When the supposed Devil's imp showed non-sensitiveness to pin-pricks, it was probably a case of auto-suggestion—or, in the case of some, a hypnotic dulling to pain caused (oftentimes in mercy) by the angel guardian.

Of the same illusory character is that phenomenon which has so puzzled all the writers on witchcraft—the icy chilliness of the sperm. This experience is entirely subjective; because it is forbidden by Borderland laws; to evoke a nervous energy for no definite result and as a harvest in offspring on the Borderland cannot be produced, it is breaking Borderland laws to sow the seed. The very fact that the Devil, who is supposed to be a deity of fire, cold in the Borderland marital union, ought to have shown his earthly partner that it was an illusion. And the psychic who expects or thinks to enact a forbidden experience on the Borderland, has only her own ignorance to thank for the illusion.

Incubi and Succubae, evil spirits who were supposed to force themselves as lovers upon both men and women, played an important part in witchcraft days. Deformed children were supposed to have sprung of such a union. Luther believed implicitly in this. Virtuous women seemed to be especially subject to the attacks of incubi, and this was looked on as attesting the cunning of Satan, who thus aimed at those noted for purity of life. It rarely, if ever, seems to have occurred to people in those days that a virtuous woman, reasonably clear-headed, is a being who is under especial angelic protection, and that when such a woman was persistently singled out by a spirit for lover-like attentions, it must have been owing to the favor of Heaven, and not to the malignity of devils. That these attentions became a great annoyance at last was only because the woman either broke the moral law in some way, or became prejudiced against every such being as an emissary of Satan. In time, by the workings of the laws of Borderland, she who through natural curiosity and romantic sentiment at fisrt hearkened to the angel lover and afterward, through the failure to live aright or think clearly, felt bound to reject him as a devil, became subject to hallucinations and also in some cases to annoying physical manifestations. Some picturesque stories have been told of such women, to whom the spirit lover has appeared in the guise of a handsome youth vainly wooing his earthly love night after night. The stories usually wind up with an account of fearful persecutions at the hands of the rejected lover who thus, by his malignity, reveals himself as the Devil. But the cases of a spirit lover who has once been received (whether as husband or only communicating spirit), it would seem as though his hypnotic suggestions often outweighed that of the priest. Sometimes the priest is appealed to but not always successfully. The Roman Catholic church has a regular rite to exorcise demons and is probably successful with the psychic through hypnotic suggestion. But in the case of a spirit lover who has once been received (whether as husband or by communicating spirit), it would seem as though his hypnotic suggestion often outweighed that of the priest to still exorcise the fiend in cases of demoniacal possession. But I am inclined to think that the very lingering of these subjective experiences indicates that her psychic hallucinations were often not only due to hypnotic suggestions by her spirit lover, but were also the result recorded in her subliminal, consequences of a veridical phenomenon which she at first encourages, whether through harmless curiosity or through the romantic and tender sentiment of a pure heart, or through the grosser impulses arising from a luxuriant and untrained imagination, matters not. When her season of ordeals set in and she was obliged to distinguish between the illusory and the real, in order to maintain communication with her interesting visitor, she either grew alarmed at the phenomena of the ordeals or else rashly assumed the whole thing to be diabolical. From this time on, it were indeed strange if she should fail to see subjectively what she expected—i. e., the Devil. All in vain now was it for her to exclaim in terror or indignation: "I will have nothing to do with you!" Her angelic lover had indeed ceased to communicate; but her sub-consciousness had not ceased to vibrate along the lines of psychical illusion; and, unless she possessed great self-control and had her sub-conscious nature well in hand, time and time only could work a cure, unless, indeed, she should implicitly submit her inner self to the priest or to some other earthly human being as her hypnotizer, in which case it was a change from the hypnotic control of a clear-seeing angel to that of a more or less blind fallible earthly man, who may or may not take undue advantage of the power placed in his hands over her main-springs of action. When one (I) considers that every woman who enters a convent is pledged to a mystic union with a heavenly bridegroom, denominated Christ, (2) that the union more often than the public is aware becomes so objectively real that the confessor feels obliged to term it "Congressus cum daemonis"; (3) That ignorance on the men's part of Borderland laws will render her experiences fantastic or diabolical:(4) that her deliverance from these experiences may be secured by a change in the hypnotizer, from an unseen angel to a visible earthly priest: we see what a power resides with confessors to mould the minds of the nuns to carry out this hypnotic suggestion for the glory of the church. For the person who has been hypnotized by spirits and who has not acquired the power of resisting hypnotic suggestion, will more readily yield to an earthly hypnotizer. That the angelic lover should force himself upon her as an incubus against her will, is contrary to Borderland laws: for in the world beyond the Borderland (the world beyond the grave), it is reckoned a sin for a woman to have aught to do with husband or lover save for love's sake; and hence the idea that a woman may be forced into a marital union on the Borderland is totally incorrect, inasmuch as the highest standards of social and ethical duty in both worlds must be lived up to by the two who meet upon the borders of the two worlds. Rationalists have tried to explain the spirit bride and spirit bridegroom as a nightmare arising from a plethoric condition of the body—an explanation which has force only when the spirit is an incubus and not a succubus and when the earthly psychic (man or woman) is asleep or dozing. But the clearest and most convincing manifestations of the objectivity of the heavenly bridegroom always come when the psychic is most clear-headed. It seems, indeed, that it is not even in a trance but only when the psychic is wide awake that the marital union takes place objectively. And this, I think, will be found to be the case with the witches. When their union with the supposed Devil was based on the faithful tender love of one woman for one man and its reciprocity, in accordance with high moral standards, then was the union objective and natural. The gross rites of the Witches' Sabbaths, with their abnormalities and absurdities, were evidently the illusions of an insane imagination in great part—although it is also doubtless true that, as Professor Wilder says:

"There is little reason to doubt that these 'Witches' Sabbaths' were formerly celebrated and that they were, in some modified form, a continuation of the outlawed worship of the Roman Empire."

(To Be Continued.)

NOTES ON THE HISTORY OF PSYCHIATRY. XV.*

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Chapter XI.

SOME PROGNOSTICS

Prognostics Which Concern Specially Described Forms of Insanity.

1. The prognosis of those conditions of soul and body which though different in degree are likely to lead to raving:

(a) Of the first rank is the nature of men because it is rendered better for sagacity however fortunate when it enjoys a good way of living, and worse, on the contrary, when it enjoys a perverse way of living.

(b) Of the second rank it [nature] conduces much to sanity, if they are not corpulent. To the high condition of the body an inflammation of desire [kaumatos phlegmone = fiery heat of burning] easily comes. When this has come, a soul of such a nature, as the water is overcome, is carried into a raving, and becomes hot.

(c) Insanity threatens the mildly raving so that they are already insane from a mild and negligable inflammation, just as much from drinking wine, as from eating meat and from obesity. A soul, however, of such a kind if it has good treatment, escapes sane.

2. Men opposite to the former, who are slow in their nature, if they employ a suitable manner of living, can be brought back to health and sanity.

3. For that disease which is called phrontis the following points are valuable for prognosis: If the prescribed remedies are well followed, the patient will in course of time

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*Continued from February, 1917.

be relieved of the disease. But unless the physician takes great care the disease will last till death.

4. But if suitable care is bestowed on the melancholy that follows bilious menses, the sick woman convalesces, otherwise in course of time she will be more afflicted. It will be best if bilious vomiting occurs, and the bowels are not greatly disturbed, and biliousness [biliosa] follows, and yet a severe female flow occurs. For if any one of these falls upon the exhausted body it will be very dangerous. But if any bilious humor, or the whole of what causes the trouble is purged, the sick woman is restored. If she is neither cared for nor any one of these happens the woman dies. A bilious menstrual flux is likely to follow this disease. And when this happens, the flow is scanty for the first days, but becomes more copious day by day. As time goes on, the disease almost always turns out serious, and, as the bilious purging advances, the uterus is eaten and ulcerated, but the sick woman can be restored by careful treatment if the menses are forced. If inflammation comes, ulcers appear but when they are cured the woman becomes barren.

5. For demonomaniac melancholiac and that connected with desire to commit suicide there is release, if nothing hinders the flow of blood from the uterus. Then also if married women become pregnant, they can become well. But if this does not happen at puberty or at least soon after, those not united to a man will be distressed with those ills.

II. CRISES AND THE TERMINATIONS OF INSANITY AS MANY AS ARE MENTIONED BY THE HIPPOCRATICS.

A. TERMINATIONS CLEARLY CRITICAL, SALUBRIOUS.

I. VARICES AND HEMORRHOIDS:

(a) If varices or hemorrhoids befall insane persons, they relieve the insanity. Hippocrates the great, claims this of those insane [mainomenois], not of those in delirium; for this aphorism, as we have desired to prove above, is in agreement with VI, II, which is more general than this. Therefore I gladly agree with Galen, Duretus and others that the word mainomenois means melancholies. For hemorrhoids seemed to the ancients closely united with black bile. Thus in Hippocrates Ipid. VI, 5, Aphorism 24: Melaines choles hos homoion haemorrhoidi [=black bile quite similar to hemorrhoid]. As a matter of fact, hemorrhoids occur more frequently in melancholics than in the raving.

(b) Hemorrhoids are an advantage when occurring in melancholics and nephritics.

Hemorrhoids at least do not always cure the atrabilious disease but at any rate are likely to give it some relief which is the only reason for the agathon [=good]. Almost the same aphorism is found also in the book of judgments, for it is alone used just the same there for toisi nephriticois [=the nephritics]: meta phrenitidon echomenois [seized by phrenitis] is the distinction. Besides the fact that it is known that hemorrhoids occur less frequently in phrenitis, as in other acute diseases than in chronic diseases, and among them even in disease of the urinary system, it is clear which reading is the better, and a consideration of the carelessness with which the book on judgments was written and of its origin can give great assistance in corroborating our judgment of the former reading.

2. Dysentery, Dropsy and Ecstasy.

"If dysentery or dropsy or ecstasy supervenes it is well."

By the word dysenteria Hippocrates, like all the other ancient physicians, understood not only that affection of the intestine that our contemporaries do, but every bloody movement of the bowels. On the force of the word ekstasis we have seen above [Chap. VI, p. 30.]

3. Convulsions.

Convulsions occurring in all melancholics relieve the melancholias.

This utterance is clearly true of those mentally affected, because the word pasi [=all] is added.

4. Fever.

Alcippus' raving ceased, following the treatment for hemorrhoids when fever occurred.

5. Vomiting and

6. Flow of Blood from the uterus as we have found above.

B. UNFORTUNATE TERMINATIONS.

1. EPILEPSY.

"Melancholics also have been generally seized with epilepsy."

We have already had occasion to advise the reader that the melancholics of this passage are not at all troubled with black bile, because their disease was said to spring from an affected mind, but only the insane melancholics.

2. COUGHING AND HOARSENESS.

"A sequel of insanity is often hoarseness with coughing."

Just as in those seized with a fever, e. g., a nervous one, if mental power returns on the departure of delirium, frequently bronchial catarrh, nay even pulmonary phthisis appears, so also in maniacs, if the mind is restored one may observe in proportion as they are convalescent in mind, so they are troubled with a more serious cough. Brendel notes on this passage: This truthful passage pertains not only to the remission of a maniacal paroxysm but also to mania, as well as severally to melancholia, or folly or apprehensive desire of solitude, et seq.

3. DEATH.

(a) We have heard just above that death follows the melancholia, originating in bilious menses, unless the sick woman is cured.

[b] Despondency with silence, and desire for solitude, which is very likely, generally causes patients to end their lives.

For we have passed over to the point of view of those who think that this statement, separate from the foregoing which was made of the leucophlegmatics [=the white phlegm people], is true of confirmed melancholics. But epieikos auton katergastikai [=likely to work out themselves] has an ambiguous significance such that it admits of a triple interpretation, Foesius comments in his notes on this passage in connection with the sense of these words.

III. CERTAIN PROGNOSTICS THAT APPEAR TO INDICATE DELIRIA RATHER THAN INSANITY.

Among the statements about which there is some doubt as to whether they are true, of insanity alone or rather of deliria, there are some that I have deemed nevertheless quite deserving of mention. Such are:

1. "Those seized with insanity are either released spontaneously from the diseases, pain occurring in the chest or feet: or a severe cough coming on cures the insanity." ten manien lyei [=the insanity.] But if none of these comes when the insanity is cured, blindness follows.

2. "A convulsion seizing the insane en toisi manikodesi [=in the seeming insane] blunts the keenness of the eyes."

3. "A severe shock (animi motio] from fear, with chill, if occurring to anyone, will be cured by fevers with sweats and sleep entirely stopping talk.

As we have said enough about esctasy ek phobou [from fear] above, we now say nothing.

4. Those seriously and acutely suffering from mental shock [mente emoti] become phrenitics if the fever returns with sweat.

CHAPTER XII.

METHOD OF TREATMENT

1. GENERAL OBSERVATIONS.

"The mind and the memory need the treatment of a physician" and later "The intelligence of the mind also is to be seen to so that it may endure by itself," says one of the Hippocratics. We shall presently see that in this treatment they have mostly proceeded from the body to the soul. And yet there are passages which advise a treatment directed toward the MIND; thus one Hippocratic just quoted recommends contemplation and care [phrontida=heed] to men for the training of the soul which is certainly appropriate [spectat] to diseases in which the patients are troubled with stupor of the mind. Thereupon those rules prescribed in the Hippocratic books for persons mentally affected, rule that in themselves appear to look to a treatment of the soul, as fasting, walking, abstinence from venereal things are all valuable for a bodily disease, a fact that will escape no one who has examined the various forms of affections of the soul. What the Hippocratics laid down about exorcism has already been presented. As indeed they rejected it and never used it, so not a single passage is found in their writings, which recommends whipping the insane, although at a later time Asclepiades, the greatest physician of the insane, and his followers considered it useful.

Lest we seem to judge too quickly in this matter, passing by what pertains to it, let us here too call to mind the directions given by the Hippocratics not to those affected with true insanity to be sure, but to those having bad dreams from which certain parts were likely to create [conicere] a future disturbance. The author of the book on dreams says: "The stars that wander here and there constrained by no control show a disturbance of the soul resulting from anxiety [psyches tina taraxin hypo merimnes = a disturbance of the soul, etc.] This is helped by the fact that when he causes relaxation of the soul he turns the soul to pleasant things and especially to sights provoking laughter. But if he has for two or three days less regard for those things from which he gets the greatest pleasure the evil too will subside; there is otherwise, danger that he fall ill." Since these constitute a precautionary measure [prophylacticum] recommended to those in whom a mental disturbance is known either by true or false indications to be imminent as a result of anxiety, we can be pardoned for believing that these matters should be mentioned in this connection.

If Plato's words are true, before the days of Herodicus the treatment of chronic diseases was much neglected. as Asclepiades treated only those diseases that came from external violence, it may be that some could conclude that even Hippocrates was less skilled in treating chronic diseases, and so also insanity than the acute diseases. As for insanity let us inquire whether that conclusion appears to be at variance with those which are found transmitted to us in the Hippocratic books on insanity.

Diet and above all an antiphlogistic one, regimen, especially exercise of the body, warmth, loosening of the bowels, now and then an emetic: among which, if they were used, warmth was likely to come first. We find these recommended by the Hippocratics for curing the insane.

An antiphlogistic diet seems to have been employed not only in the case of raving persons but even in that of melancholics. For all persons moderation in food, nay, even almost a total fasting is recommended. In the choice of foods the Hippocratics employed no little care; they ordered bitter, salt, fat and heat-producing things to be avoided, and they did not consider the eating of meat to be wholesome. As a drink they mostly refused wine, invalids should, according to their directions, use water, and wine only if mild, white, thin and diluted.

We shall treat presently of the other points pertaining to diet and regimen, since they belong to the different forms of insanity.

As in all other diseases, diet appears to have been of the greatest importance in insanity, for only two of the medicines have been handed down to us. One is mandragora root and the other, known to all, and ascertained to be the greatest remedy of the ancients for insanity is hellebore root. Physicians sent those mentally alienated to Anticyra so that they could there more easily and advantageously use this remedy. This use of hellebore is commended even in the genuine Hippocratic works for insanity and in many other chiefly melancholic diseases. Since these seem now to be employed with unequal success, it has come about that many later physicians regret the loss of the helleborism of the ancients as a specific remedy, e. g., Lorry and Arnold. But Langermann has rightly warned us that the use of hellebore is not lost, for he does not deny its virtues when drastic remedies are indicated. Therefore, in ancient times, constipation [infarctus intestinorum], foulness of the stomach [sordes gastricae] and corrupt humors in the atonic viscera seem to have been the causes of insanity. Similarly therefore in insanity and other diseases of the times of the Hippocratics—in them all a gastric and bilious characteristic was prominent as we see especially in the books on common diseases. There is need of a more careful research as to whether this was dependent on the constitution of the air or also in the manner of living of the Greeks of that time. Any one reading Greek writers will readily tend to blame diet. The Greeks, among whom the Hippocratics lived, were given to the Ionid mode of living, i. e., not simple and moderate, as may be learned from the books on diet. An additional fact is that the foods that they used can not be considered the most wholesome. A great amount of fish, pickled fruit, pork, was what constituted their meal. As to the use of hellebore among the Hippocratics, we must first notice that the name of hellebore always means white hellebore [veratrum album] unless the adjective black [melas = black] is added. In the genuine books black hellebore [helleboros melas] is mentioned only once in a doubtful passage, so that we may infer that in that age white hellebore [helleboros leukos] was alone used, whose power against insanity is quite often praised. Helleboros menenosikarta ophelein eeothen, Democritus says in the conversation with Hippocrates. The latter replies, "I have been summoned to purge you with hellebore as you are insane." Democritus had likewise already said: "You have come to me to employ hellebore for the insane." "The genuine Hippocrates also recommends a purge for melancholics and a freer and fuller one, among which purges, as mostly in Hippocrates, it cannot be doubted that those procured with the help of hellebore [veratri] are to be understood. Hellebore was employed only in chronic invalids, if indeed the Hippocratics followed directions in carrying out the treatment and if the direction from which our conclusion is drawn was of any authority; "for the delirious patients" [paraphorous=frenzied] as is directed "may not purge downwards with hellebore." Let us now pass over what is known about the indications of hellebore and the manner of employing it, since Hahnemann has discussed all these matters more fully than we have space and time for.

II. STATEMENTS ABOUT THE CURE OF SPECIAL FORMS.

1. MELANCHOLIA AND AMENTIA.

We have treated in the last section about the use of hellebore in insanity. Those who have a diathesis towards insanity as a result of improper balance of water and fire, are recommended chiefly a suitable diet which is different from the two classes of insanity. Men in whom water overcomes fire to a small degree, following a mode of living which approaches more to fire should not fill themselves with drink nor food. Fast running should be employed by them to void water, not indeed wrestling and rubbing down but rather walks after dinner, in the morning and after running.

Vomiting is recommended, after which for four days food is allowed in small quantity. Anointing is useful. To use venereal things is more harmful. Water is so much superior to fire that men are called stolid, the manner of living should be changed in so far as that they should take only drier and lighter foods and take more vigorous exercise. It is an advantage for them to use poultices [fomentis] and from them vomitings, and a long time after vomiting, to show food if a less severe vomiting occurs. Then, when the stolid have reached the point where they are what we have called imbecile, let poultices and purges from hellebore be employed beyond the just now directed manner of living.

The system of treating the disease which is called phrontis is expounded more carefully than that of the others, in the following words: "He shall drink veratrum [hellebore] when troubled with this disease, and clear his head, after clearing his head he shall employ a medicine to be drunk for the purpose to purge downward, and after that asses' milk. Let him use the smallest possible amount of food unless he is weak, and cold things and those that evacuate the bowels, and not use fat birds nor even sweet things. Let him not wash with hot water, nor drink wine, but especially water and, if not, diluted wine, nor should he exercise his body nor take walks." This is the only treatment for insanity prescribed by the Hippocratics that unites dietetic rules with the use of medicines, however apt and appropriate to the disease this can have been. Yet who is not surprised at the use of hellebore? For when the manner of living should be antiphlogistic, all irritating things should be avoided and the invalids are said to complain of sharp pains, it can be inferred that the Hippocratics did not consider hellebore an irritating remedy, otherwise they would not have offered it in that disease. But after we have more carefully investigated the powers of hellebore we shall cease being surprised; for this remedy, although sharp, nevertheless by evacuating the bowels and possibly by its narcotic effect very greatly debilitates the body, and is in that respect like digitalis, because it quickly breaks the force of the pulse and renders it almost evanescent and imperceptible. In so far hellebore is certainly not opposed to the other antiphlogistic method which the Hippocratics direct.

The treatment of that melancholia which we have described as noticed by the Hippocraties in the case of girls and barren women is very brief, for no other remedy is recommended than marriage which girls should enter as soon as possible.

Those who want to commit suicide are bidden to use mandragoras root in the morning, but in a smaller dose than would arouse raving.

2. Mania.

We shall treat this kind of insanity quite as rapidly as we have almost no directions for treating it except about the diathesis.

A patient, who although still sane, has yet, on account of the predominance of fire, begun to depart a little from sanity [prudentia] is recommended a manner of living "which looks more towards water, and does not go beyond bounds either in food, drink or work." They should run, wrestle and exercise in other ways and yet not go beyond bounds in any of them. "An older person of this diathesis is in need of diet" which looks more to water than the former. For such persons it helps more to use frumenty than bread, fish than meat, drink even more diluted, and verery less frequently and work that is suitable to their nature as much as possible; by those indeed who are forcibly undertaken, not unless forced. "They should employ a few vomitings, however, after being filled so that the body may be emptied and get hot as little as possible. To such people it is an advantage to grow thin." This treatment can surely be called antiphlogistic since all use of meat and wine is forbidden these invalids, and it is even recommended to them to become thin. For the mildly raving "they should use unkneaded frumenty and cooked vegetables, except laxative ones, and pickled fish. Nay even it is best to drink water, if possible, but if not, the nearest to it, mild white wine. The patient should take frequent morning walks, but should rise from dinner. He should have tepid water poured over him rather than be anointed. It is good also to sleep in summer less rather than much. In spring it is advantageous for those previously heated by vapors to purge with hellebore then gradually return to usual methods of living and not do any work hungry." It does not differ much from this manner of living which is prescribed with vomitings and the use of hellebore for those persons who are threatened with insanity [manenai] is inferred from the condition of stars seen in sleep. The following is the treatment verbatim: "It is a help for all these to adopt after purging with hellebore a well planned manner of living tending to produce water, and they should not drink except white, thin, mild and diluted. They should avoid sour, drying, heating and salty foods, work much according to nature and run much without undressing. Friction should be employed and no wrestling nor rolling in the dust. The invalid should recline softly in sleep, and pass his time in leisure, excepting work according to nature and walk after dinner. It is good also to use poultices and to vomit after poulticing. For thirty days he should not fill himself at all, but when he has eaten fully he should take sweet food and with mild watery things vomit twice a month."

Although this method of treatment is rather carefully outlined, nevertheless in as much as it lacks suitable indications it is of less importance for our purpose, so we have placed it last. But this manner of living is remarkably in agreement with that which is recommended in the book on diet, this seems to have been the most used method of treatment of the insane.

THESES

1. Medicine rises to philosophy, but the latter does not come down to the former.

2. Many leaps in nature.

3. The greater and less globules the several parts of the body contain, the higher degree of life they enjoy.

4. Advance corresponds to the pulse as far as pertains to rhythm.

5. In the lungs of the cadaver there is a little of the air breathed with the first breath.

6. Absorbing cutis not proved in a normal condition.

7. Not only the force of the muscles by their contraction moves the blood in the veins.

8. The more brightly red color of the blood in inflammation, is from its excited circulation.

9. The arterial blood differs from the venous more in quality than in quantity of fibrin.

10. Menstrual blood is wrongly considered a special form of blood.

11. An increased flow of blood harms the action of the brain more than a diminished flow.

12. Heat is very irritating to the heart.

13. In slugs and snails the lower surface of the body serves partly for a mouth and cardiac portion of the ventricle.

14. Conclusions from physical condition of things, are generally deceptive for physiological phenomena of the organ of sight.

15. That intermittent fever has its seat in the ganglia, is a hypothesis that can not be proved.

16. No hectic fever is demonstrated unless the lungs are affected.

17. An eruption on all contagious diseases.

18. Pneumonia cannot be diagnosed except with auscultation.

19. No division of eruptions is better than that according to external appearance.

20. Scrofulous and tuberculous are falsely considered the same bad temperament.

21. Children are also troubled with varioloids though they have had good vaccination, and have not completed their tenth year.

22. Serous dropsy either from no inflammation or from it alone.

23. Hyoscyamus the purest and blandest of the fixed narcotics.

24. Primary recent syphilitic pustules may be handled with caustic.

25. A fine help for hastening the healing of wounds is the dissection of nerves above the wound.

26. Lithotrity can not render lithotomy superfluous.

27. Ligation of the carotid above the source of the thyroid artery is generally unnecessary in treating the diseases against which it is employed.

28. The operation of turning is much more often fatal to the mother than to the foetus.

29. Plato in the Timaeus [ed. Stph., p. 86] was the first public physician for the insane.

30. The real Hippocrates was allopathic but the first homoeopathics were among the Hippocratics.

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THE MEDICAL SIDE OF THE DRINK PROBLEM*

By T. D. Crothers, M. D.,
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Historic Review.

FROM the earliest medical studies inebriety has been considered a disease by the pioneer thinkers of the past, but beyond the mere statement of the fact, there was little or no attention given to this theory.

Dr. Rush in this country in the early part of the 19th century advocated that this disease be recognized and treated. Fifty years later, Dr. Turner opened the first institution in the world for the medical study and treatment of this class. Finally, in 1870, a group of ten physicians met and formed a society for the medical study of inebriety and alcoholism, the central purpose of which was, that inebriety was a disease and curable by scientific means and measures, the same as any other disease. This society and its object startled the scientific and moral world of that day and was severely criticized as extravagant, also as an infidel effort, to destroy the sense of moral responsibility and pander to the lowest instincts of weak minded men and women. This opposition, while severe at first, gradually subsided, then there was a recognition in certain medical circles, that there was a little truth in the theory and finally a partial recognition and attempt to explain the drink evil by a combination of moral and physical causes. Then followed a wave of quackery which indorsed the disease theory fully and announced that it had discovered specific remedies for its cure. This effectually broke up most of the opposition of moral and religious reform work and literally educated the public to recognize physical causes and their removal as the most practical thing to correct this evil. Later came laboratory researches, which proved beyond question that alcohol was not a stimulant or tonic, but was a sedative and narcotic. This has been confirmed in so many different ways that it has revolutionized all former teachings on this subject and changed the medical aspect of the use of alcohol in every possible direction. The theories which have come down to us from the past have disappeared as unverifiable and the modern physician is confronted with a new set of facts entirely different from that of a generation ago. The principles of the society for the study of alcohol, announced forty-seven years ago, are now recognized and the great question comes up, what to do along therapeutic and preventive lines of medicine that will limit or prevent this evil.

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* Read before the American Society for the Study of Alcohol and Other Narcotics on June 6, 1917, New York City.

This society has met annually for forty-seven years and several hundred papers have been read on all phases of the alcoholic problem, particularly along its scientific side. At the last meeting in New York, it was announced that the first principles had been so amply confirmed by the studies of nearly a half a century, that the society should now take another step forward. Not in the declaration of any great advance, but in the obvious duty of more exact studies. The great questions now are: What is this neurosis, disease, that is called inebriety and alcoholism? Where is it grown, bred and from what soil does it originate and what conditions favor its growth and development, despite all the moral efforts of religion, education, social studies? There are, obviously, some great laws unknown at present, which are formative of the drink and drug neurosis. Laws which move with the same certainty and positiveness as that of any other defect of the human brain. The present wave of prohibition is certain to abolish the sale of spirits as a stimulant and narcotic. It is absolutely certain that this will not break up the drink evil, but only remove a list of exciting causes and leave the great first causes untouched.

It is a curious fact, that all the present reformatory efforts and all the societies, religious and otherwise, that are concentrating all their energies to drive out the saloon and break up the alcoholic evil, are founded on the delusive theory, that the use of spirits is a vice, a moral evil, the product of weak will and other defects of the mind, which could and should be corrected by moral and educational efforts. This is unsupported by every scientific study and contradicted by laboratory work and clinical observation of trained physicians who are seeking the facts, regardless of theories. It is also curious to note that the so-called temperance literature of today is a medley of observations, opinions and theories based on false conceptions and of course evanescent. To the scientific man this literature is full of startling facts buried up in conclusions, in theories. Facts of the development of inebriety, of its progress, of the different phases and symptoms, which are detailed with startling minuteness, but whose psychological import is entirely lost sight of. The many enthusiastic reformers who have described their own personal experience in the most glowing terms, have been actually contributing facts, which the future scientist will have no difficulty in separating—in the emotionalism and the stupid theories which it is made to sustain.

In the New York library, there are over two thousand volumes of temperance literature of this character. It is a rare mine of psychological facts that are now buried. The periodic literature is much the same, only that it has less concern with theories and is more a matter of opinions. The cermonic literature on this subject is another rich mine of facts which will be uncovered in the near future.

The Hartford Research Foundation, organized for the special study of the physical and psychical causes which have sowed the seed and formed the soil for inebriety and alcoholism, has been confronted with the objection, that the facts from which to draw conclusions will require years of careful study. In reality, the reformers have been furnishing these facts and all unknown to themselves, they have laid the foundation for a broader study of the marvelous facts and laws, which control and shape this disease. So-called temperance revivals in which the personal experience of the victims form the stock and store of their work, give the most graphic pictures of the operations of laws and forces and the presence of physical conditions, that have been formative and the psychologist has only to listen and note the facts and their wealth of meaning and significance. The army of so-called incurables, meaning men and women whose use of spirits has been excessive to the degree of producing what apparently seems to be incurable conditions, have been estimated to extend over a million in number. Beyond this there is another army of so-called moderate drinkers and periodic drinkers, who are never seen in public and who rarely ever are regarded other than persons who give way to their morbid impressions and who indulge in spirits for countless reasons. This army includes many of the world's great workers and extends from the highest ranks of society downwards. Of course, there is a large number of these that go down to the incurable stage but most of them retain a degree of vigor and die from intercurrent diseases. Recently, several statistical studies have made it very clear that the use of alcohol is followed by the most degenerating influences and next to syphilis it is a source of the greatest peril to the health and longevity of the race. Researches in pathology show the damage to cell and tissue, that are directly traceable to this cause; notwithstanding all this, about all we know of the subject comes from te delusive theories of moralists and reformers. Every thoughful physician is brought face to face with a range of physical causes and physical phenomena which are practically unknown. The new work proposes to group the facts and go along with the drink craze. There is already a mass of conclusions, showing that there are physical and psychical defects in the organism and the use of alcohol is only a symptom of this and the great unknown field is—what are these defects and what laws govern their rise and fall? What morphological changes, the direct results of injuries, blows, crushed tissues and bones, nerve injuries, sun-strokes, heat strokes, concussions and physical damages and perversions of cell activities, are the starting primary causes that seek relief in the narcotic alcohol? What changes growing out of infectious diseases impairing cell growths and how far does defective nutrition, hypernutrition and the formation of poisons produce irritation that calls for relief? How far does mental and physical strain to the organism and how far does inactivity and atropic conditions act in the same way? These are only a few of the phenomena and symptomology that is real and tangible and experience shows that when some of these causes are removed or lessened, the alcoholic symptoms disappear, furnishing the most conclusive evidence that physical and psychical conditions are the factors in this alcoholic evil. Beyond this, there is another realm of mental forces, which we call "psychic," including causes and influences which are as positive and clear as the result of poisons. When these causes are studied and grouped, we reach the same conclusion, viz., that we are dealing with a veritable disease, born, bred and grown, and going on down following the same line as that of any other destructive power; in addition, perpetuating themselves by impairing the power of reproducing and in countless ways assisting in destruction of life and human activities. This is the new field for so-called Temperance Work. This is the new field that appeals to physicians who of all others are best equipped for such study. The Hartford Research Work is occupying this field and already they are indicating a wealth of facts, which will really open a new field of scientific exploration. Practically, it rises above the curative stages that have been so prominent. It goes back to first causes and seeks to remove these and thus check the evil at its beginning. If the medical profession could realize the magnitude of this subject they would fit themselves for counsel and advice to armies of poor distracted men and women using spirits and drugs, and who do not know how to escape or where to go for advice. This does not mean that they should take up a residence in some institution and follow some routine line of cure, but it signifies in the broadest way that they should seek to know why they give way to drink and drugs as a relief to present conditions. At present there is abundant evidence to show that a study of each and every individual case presents faults and defects which can be removed, lessened and changed and thus bring about a so-called cure. The following are some of the conclusions, from this new so-called Temperance Work, which is exclusively scientific and appeals to physicians for help.

First. The physical and psychical facts which really prepare the soil and sow the seed for the development and growth of inebriety and alcoholism are veritable realities and most unmistakable indications that we are dealing with disease in the broad sense of that word.

Second. These facts may be very complex and be traceable to heredity and a great variety of other causes, which do not appear except when studied at close range. Their outbreak and development in inebriety are no chance happenings or accidents in any sense of that word.

Third. The armies of active brain workers in all grades of society and with all degrees of culture and training carry with them a pronounced susceptibility or literal immunity, transient or permanent, to narcotic drugs of any class. These are determinate causes, which can be mapped out and will attain a great prominence in a future study.

Fourth. The Research Foundation starts higher up than an effort to find therapeutic means and measures of control. It assumes that there are causes in every individual case, which if understood and corrected, would point out the actual curable and preventable means. It assumes that the real temperance work of the age must be along different lines, above all theory or personal opinion. While the work of reformers is most commendable and deserves our warmest sympathy as medical men, our efforts should be concentrated higher up, with full recognition of the great laws of cause and effect.

Fifth. The announcement of our society forty-seven years ago, that inebriety was a disease and curable as other diseases are, has been established beyond all question and now the question comes up, to discover the causes and conditions, which we are absolutely certain precede this great drink evil, and find out what they are and what they mean. Then when Prohibition wins and the saloon is abolished and the sale of spirits as a beverage is a thing of the past, we can take up this great unsolved problem of the deteriorating causes which confront our civilization and determine how they can be corrected, prevented and cured.

Sixth. Another fact—evidence from all sources gathered by irregulars, theorists and persons holding the most discordant views, show that this disease is curable in the sense of being checked and relieved for the time. When it comes into the realm of science and becomes the subject of exact study by physicians, the possibilities of practical help and relief exceed all possible expectations. The claim of quacks that ninety per cent are cured by their means and methods will lose its extravagant character, when the real facts are understood and made practical. Thus, the medical side of the drink problem, which is now unknown and buried up in the theories and countless opinions, will emerge and a new field in the practice of medicine will come to the surface.

WHAT IS THE MATTER WITH THE DOCTOR?

By David S. Booth, M. D.,
Saint Louis.

UNDER this caption, a recent number of the Medical Review of Reviews contains a symposium on the medical profession, which deserves more than a passing notice. The contributions are by lay writers of both sexes, who have attained prominence in their various vocations, and are probably the result of each author's limited observation or experience, which if applied to any or all other lines of human endeavor, would lead to the same varied conclusions. Some are laudatory, but many are disparaging and a few discredit the entire medical profession. Most of the contributions disclose a lamentable ignorance of present day medicine and its honorable and unostentatious practitioners who constitute the majority of the members of the regular medical profession. This is not to be wondered at when we consider their knowledge is usually obtained from the advertisements of quacks or patent medicine manufacturers, or other equally questionable sources.

Those who have fallen into the hands of such practitioners as merit the criticisms, deserve our pity only so far as they have striven to protect themselves. Have they co-operated with the medical profession in their efforts to have laws passed to protect the people from the grossly ignorant and vicious? Did they use due care in the selection of a physician? Did they fully co-operate with the attending physician to obtain the end sought? Have they given all possible encouragement to scientific medical advancement?

We assume that all the criticisms of medicine and of doctors are bona fide, viz., from actual observation or experience of the critics, although such evidence, in legal lore, is usually "incompetent, irrelevant and immaterial."

We know a few of the criticisms are justifiable, but they are of shortcomings well known to the medical profession, which has been unsuccessfully striving to correct them by legal enactments. Did our critics lend their aid?

Because the National Association of the regular medical profession, against its own financial interest, and hence, that of its members, was active in support of bills to compel people—if you please—to be well, it is called a trust.

We regret lack of space to give due consideration to this accusation; however, we must admit the doctors' "trust" is the biggest "trust" extant—why, it trusts everybody! and we venture the assertion that the "buster" of this trust will receive the lasting gratitude of the entire medical profession.

Thus is the medical profession between scylla and chyribdis.

We are accused of giving "physic" instead of "advice to prevent disease," and of treating "effects" rather than "causes," yet it is problematical if our critics themselves ever sought the services of a physician unless incapacitated or racked with aches and pains, from which they were unwilling to suffer until "advice" alone relieved them, or, receiving needed advice on "how to live," ever heeded it after they felt themselves restored.

The writer could give some amusing reminiscences of the broken vows of the afflicted regarding their mode of life after they should recover from illnesses caused by dissipation or incorrect living.

> "The devil was sick, the devil a monk would be;
> The devil was well, the devil a monk was he."

The physician may consider himself fortunate if his patient follows instructions as to his mode of living during the course of active medical treatment.

We recollect one patient who, though having received no benefit from several different practitioners, absolutely refused to give up his club life with its wine, tobacco, late hours, etc., even to get relief, stating he "may as well be dead as to do so;" to which we replied that "even so, he probably would not have to be dead for long; whereas, if he did not, he certainly would be dead a long time."

In our many years of practice, we have had but one person to consult us when not ill, or did not believe himself ill, and we believe this to be the general experience of the profession.

We do not desire to "beg the question" by this indirection for we know the capable physician will give the necessary advice for both cure and prevention, if he obtain the ear of the patient and the patient is willing to recompense the physician for his time and knowledge, which are his "stock in trade," and if the applicant is unable to pay, the service will be rendered without a consideration. However, one must not expect to obtain proper advice from "curb-stone" consultations.

We once treated a patient, who, after recovery, refused to pay even for residence visits in which we did not write a prescription for medicine, as "there was nothing done," and it is not unusual for office patients to object to paying unless given a prescription.

One critic writes, "there is too much conservatism; there should be complete freedom of action;" yet let the practitioner depart from the "beaten path" and the result not prove satisfactory to some shyster lawyer, and he will have to face a suit for malpractice.

Paraphrasing a familiar maxim:

"In 'medicine' as in fashion, the same rule will hold;
Alike 'hazardous' if too new or old;
Be not the first by whom the new is tried,
Nor yet the last to lay the old aside."

We have no quarrel with our critics, since we recognize "they know not what they do:" and believe they would be convinced of the injustice of their criticisms, if they could accompany a physician on his rounds even for a few days.

We disagree with those who do not recognize medicine as a science simply because the physician does not always obtain the result expected; measured by this standard, there could be no science. Science is knowledge, not the practical application of that knowledge.

It must be recalled that the physician, as expressed in a higher court decision, "deals not with insensate matter like the stonemason or bricklayer, who can choose their materials and adjust them according to mathematical lines, but he has a suffering human being to treat, a nervous system to tranquilize, and a will to regulate and control,"—withal we contend that the physician can compete with artisans, craftsmen or business men, in average results. We know not a line of human endeavor with which we have had experience in which we cannot recite errors and failures. Voltaire wrote, "a physician is an unfortunate gentleman expected daily to perform a miracle, namely, to reconcile health with intemperance," and it may also be said, he is the only craftsman expected to repair a mechanism while "speeding" and then "ostracised" if he fails to meet the demands of the petulant, hypercritical speeder, either in results obtained, time consumed or fees charged.

We do not believe any "within the ranks" would think of the medical profession as "bigoted and narrow," though these "qualifications" often build large practices; as an old physician facetiously said, "if you want never to be at 'sea', read only one book, viz., Dr ———'s Family Physician."

The laity will rarely "stand for" doubt or hesitancy in their medical attendants, hence compel hasty and positive diagnoses with the consequent frequent errors.

The greatest error of the medical profession is that of failure to enlighten the public by propaganda regarding the rationale of medicine, by which it may also demonstrate that rational medicine (in contradistinction to the various exclusive systems, sects and cults which have harrassed medicine continually) has been progressive and has kept pace with the progress of all other arts and sciences, and that its insufficiency is more apparent than real and then more the fault of the public than the physicians.

We regret time and space do not permit a full consideration of all points at issue; however, to all criticisms not specifically answered, we enter a "general denial" —to borrow a legal phrase, and hope at some future time, to reply at length.

Anent this subject, we quote the following from press reports of our own public lectures:

"If physicians are twitted with disagreements, how is it with theologians with their different denominations, creeds and methods of church government, basing their beliefs upon the same Divine Revelations? The lawyers, whose opinions are usually given after thorough and deliberative study? And the statesmen, with their diametrically opposite views on the tariff, currency, and mode of taxation, as well as to our policy in our newly acquired territory?

"We are told that mathematics is not only a science, but an exact science, yet how often do we see the failure of merchants whose business is of necessity run on mathematical principals; as well do we note the errors of the civil engineer whose every calculation is made in figures, and of the architect whose inaccuracies are often revealed to the builder, to say nothing of the politician who can 'figure' his party into power irrespective of the political complexion of the voters.

"These but prove the fallibility of humanity; as tersely put by Locke, 'error is not a fault of our knowledge, but a mistake of our judgment.'

"That there are many sources of error in the practical application of the teachings of medicine aside from the natural limitation of human knowledge and power, we both recognize and admit.

"In the first place, we have an uneven race with that inevitable, fleet, and silent messenger, death, to which we must all succumb, sooner or later, then comes personal idiosyncracy, by which is meant a peculiarity of constitution wherein remedies do not act in accustomed manner; false or erroneous statements of patients to the physicians; refusal of patients to permit thorough investigations of their conditions; refusal or failure to follow instructions, and the now rare possiblity of inferiority of drugs and intentional substitution by the druggist—for all of which, the potency of the science of medicine is assailed.

"Under 'idiosyncracy' might be included that peculiarity of certain persons to forget(?) the doctor's pay-day, 'all work and no pay' frequently 'makes a dull physician,' and while the doctor's attention is diverted by this serious(?) condition, he might overlook others, perhaps more serious to the patient, although forgetfulness is quite frequently a forerunner of that wide-spread American disease, Nervous Prostration, and may lead to "madness."

"We have no eulogy to pronounce upon the physician; he needs none; his labors of centuries stand a living monument of self-sacrifice in his unparalleled devotion to duty and fidelity to trust.

"Never has there been exhibited in the history of the world higher examples of dauntless courage, heroic endurance or unswerving loyalty than by the physician in his ministrations to the sick and wounded.

"In the language of the poet:

'A wise physician skilled our ills to heal,
Is more than armies to the public weal;'

nevertheless, where are the statues of bronze to perpetuate his memory, or shafts of granite to emblazon his fame?

"If science has bridled steam, medicine has controlled the epidemics which formerly devastated whole countries: if science has made the dreaded lightning subservient to her behests; medicine has utilized that same agent in exploring the innermost recesses of the body and as a powerful therapeutic agent: if science has made it possible for one man to do the work for which several were formerly required; medicine has provided remedies for preventing many, and greatly abbreviating almost all, diseases, thus greatly facilitating him in his labors, and even should we believe with Byron, that:

'Physicians mend or end us,
Secundum artem, and at them sneer
In health; when ill, we call them to attend us,
Without the least propensity to jeer.'

"Alexander Pope combined truth and poetry in charming satire, when he wrote:

'God and the doctor, we alike adore,
But only when in danger, not before;
The danger o'er, both are alike requited,
God is forgotten and the doctor slighted.' "

SELECTIONS

CLINICAL NEUROLOGY

Acute Syphilitic Meningitis.—Bronstein (International Clinics) considers that the term acute syphilitic meningitis should be more particularly applied to acute meningeal phenomena of the secondary period, sometimes preceding but more frequently accompanying, the cutaneous manifestations of this period. The pathology is essentially a meningovascularitis with hypersecretion of the cerebrospinal fluid. Prodromal symptoms, such as headache and insomnia, may or may not occur. Acute syphilitic meningitis at its height, presents the clinical picture of the tubercular form, differing from the latter by the indistinctness of the symptoms, such as contractures and stiffness of the neck, and by the absence of any marked disturbance of the pulse and respiration. In luetic form fever is apt to be absent and there may be remissions and relapses. Lumbar puncture reveals a considerable hypertension of the cerebrospinal fluid, albumin in quantity, and a marked lymphocytosis with plasmozellen. The cerebrospinal fluid may yield a positive Wassermann even when the blood serum is negative. Other manifestations of syphilis are to be looked for. The immediate prognosis is rarely fatal but the ultimate prognosis should be reserved. Prophylactic treatment is recommended whenever the cerebro-spinal fluid shows a lymphocytosis, even when all meningeal symptoms are wanting. The treatment consists in frequently repeated removal of the cerebrospinal fluid in considerable amount, combined with intravenous injection of cyanide of mercury and intraspinal injections of colloidal mercury. Neosalvarsan or salvarsan have a much more rapid action, but must be prudently handled in neurologic lesions of syphilis.

Influence of Intestinal Stasis on the Nervous System.—Dr. M. W. Hoge (Jour. Mo. State Med. Assoc.) writes:

The nervous symptoms that seem clinically related to intestinal stasis are commonly lassitude, headache, vertigo, emotional irritability and neuralgias. More rarely, pronounced psychic disorders, coma, convulsions. Some of these symptoms seem definitely due to absorption of toxic materials from the intestinal canal; in the case of others, the role of irritation produced by retained fecal masses must be considered, and the relative influence of these two agencies can be properly appraised only after more definite knowledge is obtained on the subject of intestinal putrefaction, and the degree to which its products are absorbed into the blood, and of their effects after absorption.

No doubt convulsions epileptoid in character may be induced by toxic causes and by intestinal irritation, but here, as under other circumstances, the constitutional predisposition of the patient must be considered.

The present-day view of the so-called psychoneuroses, that is to say, hysteria, neurasthenia, psychasthenia, etc., is that they are definitely of psychic origin. That where they seem related to a physical disease the latter acts as an exciting or releasing, not as a truly causative agent, or else merely serves as a convenient point of attachment round which the psychic symptoms group themselves.

As regards the psychoses proper, the authorities admit the occasional occurrence of attacks due to absorption of intestinal toxins. Such attacks are of the type usually resulting from intoxication, excitement, depression or mixed states, with hallucinations and mental confusion, and do not present individual peculiarities sufficient to distinguish them from cases of the same type due to other causes. Where such attacks subside promptly on clearing out the intestinal tract, the conclusion would seem justified that intestinal stasis was the cause. Yet we must remember that the same results may occasionally follow other procedures as chloroform or ether narcosis. Here too the constitutional predisposition of the patient must not be disregarded.

Quite commonly constipation in various degrees is present in many of the psychoses and it often happens that the intensity of the symptoms is relieved by correcting this, without however essentially influencing the progress of the mental disorder. Also, mental influences as a causal factor in inducing digestive, including intestinal, disorders must not be overlooked.

The very decided influence of mental and especially emotional states upon the functions of the viscera is among the earliest of recorded biological observations, is a fact of every day experience and a common subject of laboratory studies.

It is also a usual experience that when the particular derangement under consideration is present in a neurosis or psychosis, it may vary in intensity with the nervous disorder and be recovered from at the same time, under therapeutic measures adapted principally or solely to the latter.

So that the attitude of the neurologist toward constipation is in general the same as toward other physical disorders occurring in conjunction with a nervous disease: namely, that even if the former condition be not a cause of the latter, its removal will probably facilitate recovery from it or at any rate ameliorate the symptoms. That in order to have a perfect recovery from any disorder the whole organism should as nearly as possible be restored to its normal working conditions.

THE WASSERMAN REACTION IN MENTAL DEFICIENCY IN CHILDREN.—Alfred Gordon (Arch, Pediat., 1916, xxxiii, 273) in a study of 78 cases presenting mental defects of varying degrees, makes the following points as regards hereditary syphilis: Even in the absence of all external evidences in child and parents, every case of mental abnormality in children should be investigated from the standpoint of hereditary syphilis. When hereditary syphilis causes extensive deformities or actual malformations of the central nervous system or other organs, therapeutic endeavors are baseless and in vain. But when there is only feeble-mindedness of various degrees, and when this is associated with epilepsy, tremors or choreiform movements, or frequent and persistent headaches, or where there are neurotic phenomena such as outbreaks of anger, of violence or tendency to vicious habits, then encouraging results may be obtained from methods based on the newer serologic investigations. In the series of 78 cases comprising imbeciles, idiots and feeble-minded with epilepsy, petit mal, headaches and those without functional or organic disorders, the Wasserman test showed that 50 per cent presented a positive reaction. While syphilis causes permanently defective offspring it also causes mental deficiency which is amenable to improvement. The detection of such recoverable cases is of paramount value. A negative Wasserman result should be followed by repeated tests at intervals. A positive result should be followed by vigorous and prolonged treatment by antisyphilitic remedies. Children up to the age of five were given mercurials and iodids. From that age on the treatment commenced with neosalvarsan, then continued with mercury and the iodids. The intraspinal method of salvarsanized serum was used exclusively on children of fifteen and sixteen years and supplemented by mercury and iodids. Mercury was given exclusively by inunction. The cases with organic changes were unresponsive. The feeble-minded showed decided improvement in some, epileptic attacks diminished or ceased, those with petit mal especially showed improvement and the mentality in all these functional conditions showed striking improvement. The most striking improvement was in the feeble-minded with no functional disturbance.—Amer. Jour. Med. Science.

THE NEUROPATHIC OR NERVOUS CHILD.—E. B. Augell (New York State Jour. Med., 1917, xvii, 13) in a discussion of the nervous child quotes Dr. Francis Warner's description of the typical signs of the nervous child. Nervous children are apt to complain of headaches, are poor sleepers and hard to put to sleep, talk in their sleep and grind their teeth and are tired on arising. They are delicate without having any disease and are rarely attacked by illness. They are not strong, cannot walk far without tiring; some days they are too tired to do anything and must rest. Their appetite is capricious and they easily lose weight. They are generally well made in body, but may be tall and rather thin, with subnormal body weight. In nerve signs they give evidence of weakness and overspontaneity. Augell lays emphasis on the study of the physiognomy and muscle action in the observation of children and suggests a well tried out test employed by Dr. Warner. In asking a child to extend its arms in imitation of your own example, the arms should come out parallel, hands almost on a level, fingers when extended are curved slightly downward from the wrist with the thumbs closely applied to the hands, a position which denotes the balanced action of a normally acting brain. The nervous child, however, shows a different result. If tired, there is dropping of one arm below the other, the thumb drops away from the hand and in extreme cases the hands drop from the wrist. If the nervous system is in a tense, unbalanced condition the fingers are overextended with the knuckles inclined slightly backward, marking overmuscular action. This sign was noted in 25 per cent. of the author's cases. Augell is inclined to regard nervousness in children as dependent on ill-balanced nervous control rather than exhausted nervous energy. The relation between muscular and brain activity is very direct and Augell impresses the value of trained muscular exercise in increasing the size of the motor convolutions of the brain as well as the depth of the cortex and in developing ready control and quick response in the mind. He cites military drill as exceptionally valuable in this respect and in developing self-control which is a vital factor in the treatment of the nervous child. Neurotic inheritance plays a more important part in childhood neurosis than in the adult type. In 80 cases of typically nervous children, 70 per cent. gave a history of neurotic inheritance. The arthritic diathesis is another important factor, about 30 per cent. giving a family history of arthritic trouble in the immediate ancestry. Among a list of physical conditions and abnormalities which cause nervousness, Augell mentions bad oral hygiene, disorders of the digestive tract or faulty metabolism, especially a too high protein diet, and conditions due to bad ventilation in home and school.—Amer. Jour. Med. Sciences.

Little's Disease.—Joseph S. Wall (Arch. Pediat., 1916, xxxiii, 812 Amr. Jol. Med. Sciences) brings out the various conceptions held by different authorities on this malady, showing quite a diversion of opinion as to what class of cases of spastic paraplegia should be designated as Little's disease. Spastic paralysis, because seen in infancy and childhood should not be classed as Little's disease solely for that reason. Wall states that Little's disease appears to represent cases of congenital spastic rigidity or paralysis having their origin before or during the act of birth from causes within the central nervous system, particularly the cerebrum and that this excluded the whole group of spastic paraplegias occurring during infancy as well as those paralyses dependent upon peripheral lesions. The causative factors are both prenatal and natal. Prematurity apparently is held to be the main general factor, whether the effects are due to undeveloped fibers in the pyramidal tracts of the brain or as the French writers believe, to syphilis either in the father or mother. However, prematurity in itself may be questioned as originating Little's disease since so many premature infants grow and develop into healthy beings. Next to prematurity, perhaps intimately associated with it among prenatal factors, should be placed syphilis. The French school has brought many arguments to prove that syphilis is the most common cause of the disease. Natal causes include hemorrhages from trauma during labor. Basal hemorrhages are usually fatal while those of the cortex permit of life and the consequent degenerations shown in Little's disease. Asphyxia neonatorum has been noted in from one-third to one-half of many of the recorded cases. It would seem difficult, however, to differentiate between asphyxia as a cause of hemorrhage and asphyxia as a result and symptom of hemorrhage which has preceded the state of suspended animation. The pathological changes causing the paralyses and spasticities taken collectively show hemorrage, meningeal and cortical, defect, degeneration and inflammation. Primary destruction or non-development of the brain surface is largely responsible for the production of the syndrome of Little. Early symptomatology includes spasticity of the extremities and trunk, inability to support the head or retraction of the head, incoordination of the upper extremities, asymmetry of the face, difficulty in attracting the attention of the eyes, strabismus, "choking sounds" and laryngeal stridor. Later on lack of proper development and infantile growth become apparent and the symptom-complex depended upon the degree of cortical involvement.

NEURASTHENIA AND PSYCHASTHENIA.—Col. Howard H. Tooth (J. Roy. Army Med. Corps) writes that in the army individuals are subjected to all sorts of shock and strain and therefore infinite functional phenomena occur, e.g., constriction of visual fields, amaurosis, aphonia, deafness, various forms of paralysis, etc. One group consists of patients who, after some shock or strain, show essentially the symptoms of fatigue and abulia, the symptoms especially characteristic of true neurasthenia. The author believes that neurasthenia must be due to some biochemical change in the nervous system of which we as yet have no definite knowledge.

Besides the essential symptoms of neurasthenia, many other symptoms occur, which often lead to much confusion in diagnosis. Among the most frequent are vertical or posterior headache, which is increased by exertion and diminished by rest. Hyperacousis is quite common and may be so marked that pleasant sounds as music may be repugnant. Over-sensitiveness to light or diminution in the acuity of vision is often associated with a ready fatigue. The neurasthenic is morbidly conscious of visceral movements and become morbidly anxious concerning their physical condition. Pains in the neck, back or extremities may be very severe and defy all means of relief. Muscular tremors, especially of the facial muscles and eyelids, is very common. These tremors are fine, independent and vibratory and cannot be simulated. The knee jerks may be decreased or normal but more often increased. Testing the reflexes may give rise to more or less extensive disagreeable sensations or even a marked emotional state. An irregular exhaustive clonus is not uncommon. Very often there is no response to plantar stimulation.

In psychasthenia the symptoms of neurasthenia are usually present, but the picture is dominated by physical or mental symptoms. There is an attitude of depression with an underlying aspect of fear and apprehension of undefined evil. Suicide is often talked of, but rarely carried out. There is usually a loss of interest, a feeling of intense boredom, and irritability. There even may be an actual loss of memory for current events. Insomnia is a constant and early symptom.

The two main etiological factors in the neurosis, aside from the inherent personality, are physical stress or strain and shock. It is interesting to note that the neurosis rarely develops in soldiers who have been physically injured.

Usually a nervous breakdown runs a course of about a year's duration. In the treatment the first and most important point is to gain the confidence of the patient, for the assurance of the physician goes a great way toward re-establishing a healthy attitude of mind in the patient. This confidence is usually obtained if the doctor listens patiently and sympathetically to the long account of symptoms and makes a thorough physical examination. The routine described depends entirely on the individual characteristics. In some, rest in bed and isolation is best; in others, outdoor exercise, travel, etc.; and, in others, continuance of work on a low scale.—Cleveland Medical Journal.

A NEW FAMILIAL INFANTILE FORM OF DIFFUSE BRAIN-SCLEROSIS.—K. Krabbee Brain (London) Vol. xxxix, Parts I-III, Archi. of Diagnosis, Oct., 1916.—The so-called diffuse sclerosis of the brain in children may be divided into at least three quite distinct types: (1) A syphilitic form; (2) Schilder's encephalitis periaxialis diffusa; (3) a familial infantile form of which 5 cases are discussed in the present paper; the literature probably contains one other case. This form shows the following characteristics: It is usually a familial disease; it sets in somewhat acutely in about the fifth month in a child who up to then has been quite healthy; it progresses on a chronic course, ending with death five to six months after the onset; universal rigidity of the musculature, violent tonic spasms, probably causing pain, and brought on by touching or noise form the characteristic symptoms. As a rule nystagmus is present, and in the later stage, atrophy of the optic nerve. Periodic elevations of the temperature occur without perceptible cause outside of the central nervous system. Finally, extensive paresis and pronounced debility close the scene. The pathologico-anatomical findings are: a marked hardness of the white substance of the brain without alteration of its shape. Complete destruction of the white matter of the cerebellum and degeneration of the spinal nerve tracts are present. The affection must be regarded as a purely degenerative and not as an inflammatory process.—Pediatrics.

NEURO-DIAGNOSIS

How to Diagnose the Cause of Dizziness.—Lewis Fisher, of Philadelphia, writing in the December Pennsylvania Medical Journal, points out that dizziness or vertigo is an expression of disturbed equilibration. In order to determine, therefore, the causes of dizziness, it is necessary to analyze the integrity of the equilibratory apparatus. The static portion of the internal ear, and the nerve-paths and brain centers in relation with it constitute the vestibular apparatus. This vestibular apparatus is the chief organ of equilibration. Vertigo, from whatever cause, belongs therefore exclusively in the domain of otology, and can be readily diagnosed by means of the newer ear tests. Examinations upon hundreds of 'dizzy' cases in the Ear Department of the University of Pennsylvania show that by means of these ear tests every case of vertigo can be definitely diagnosed and its cause determined.

Vertigo can result only when the vestibular apparatus is affected. When disease in remote organs is accompanied by vertigo, it is because those pathological states affect the vestibular apparatus.

When examining a patient with vertigo the following possibilities must be thought of: 1. The vertigo may be due to some simple irritation of the vestibular tracts. In such a case it is temporary and fleeting in character, leaving the apparatus itself intact. 2. There may be an actual lesion of the vestibular apparatus located in the internal ear itself or what we call an 'end-organ' lesion. 3. The internal ear may be intact, and the lesion located somewhere within the cranium.

An examination of the vestibular apparatus by the ear tests determines to which class the case belongs. Such an examination consists of a search for spontaneous vestibular phenomena, such as spontaneous nystagmus, spontaneous falling, spontaneous past-pointing, and spontaneous vertigo, and also of an examination of the phenomena obtained by ear stimulation. The latter are the more important. Stimulation of the ear produces nystagmus, vertigo, past-pointing and falling. Normal responses to stimulation indicate an unaffected vestibular apparatus, whereas impaired or absent responses point definitely to a block somewhere along one of these pathways. A knowledge of the anatomy of the parts enables one to locate accurately the site of the lesion.

The following 'phenomena complex' are given:

1. When the results of ear stimulation are nystagmus none, vertigo none, past pointing none and falling none, the lesion is in the labyrinth or eighth nerve.

2. Should stimulation of the horizontal semicircular canals produce nystagmus none, vertigo normal, past pointing normal—the lesion is in the medulla oblongata, between Deiters' nucleus and the posterior longitudinal bundle.

3. If stimulation of the vertical semicircular canal produces: nystagmus none, vertigo normal, past pointing normal and falling normal, the lesion is in the posterior portion of the pons near the posterior longitudinal bundle.

4. If stimulation of the horizontal semicircular canals

gives: nystagmus normal, vertigo none and past pointing none, the lesion is in the inferior cerebellar peduncle on that side, or at a point further up along the vestibulo-cerebello-cerebral tract in the pathway for dizziness.

5. If stimulation of the vertical semicircular canals produces: nystagmus normal, vertigo none, past pointing none and falling none, the lesion is in the middle cerebellar peduncle, or at some other portion of the vestibular-cerebello-cerebral tract, higher up.

6. If stimulation of the horizontal semicircular canals and also of the vertical semicircular canals produces: nystagmus none, vertigo normal, past pointing normal and falling normal, the lesion is in the posterior longitudinal bundle.

7. If stimulation of the horizontal and vertical semicircular canals produces: nystagmus normal, past pointing none, falling none, and vertigo none, it indicates a lesion of the cerebellar nuclei of that side where the fibers from the inferior and middle cerebellar peduncles come together, or in the upper portion of the pons where all these fibers again come together at the decussation of these fibers in the superior cerebellar peduncles.—Author's Abstract in Medical Review of Reviews.

TRUE AND SIMULATED SCIATICA.—At the Reunion medical de la VI-e armee, Dr. A. Barre reported that, having an opportunity to study about 100 sciatica patients, he undertook to find a number of objective signs which would permit an easier diagnosis of true sciatica and the recognition of simulation. He believes that especially in military surgery the "classic" signs of sciatica are of little value. The most careful examiner runs a risk, according to the usual method, of suggestion. He advises examination of the sensibility "by surprise" and mentions several devices for the purpose. He attaches special importance to the "sign of the adductors," which consists in pinching forcibly between the thumb and fingers the internal portion of the mass of the adductors of the healthy side and the affected side. The pains are much more marked on the side of the sciatica. The modifications of the Achilles tendon reflex are often slight or non-existent, while the "retromalleolar reflex" described by Barre is much diminished or abolished; this objective sign has great practical value. The muscular atrophy is ordinarily very slight and rarely exceeds 1 to 2 cm. There often is none in the thigh or the leg, while it is possible to perceive pronounced atrophy of the extensor brevis digitorum pedis, which is expecially easy of examination. This "sign of the extensor brevis digitorum pedis" is quite frequent and generally early. The hypotonia of the muscle innervated by the painful sciatic nerve is often difficult to recognize when the attempt is made to demonstrate it by palpation or sight. Barre indicates two indirect objective signs of this hypotonia: the relaxation, the slight tension and the easy depressibility of the Achilles tendon and, consequently, the lower tone of the percussion sound of this tendon and the lowering of the heel on the side of the sciatica. Another very early and very reliable sign is the lowering of the temperature of the affected side in comparison with that of the healthy side. The region in which this sign should be sought expecially and which is also the only region in which at times it exists is the external surface of the leg in its lower one-half or one-third. Independent of these signs, four of which are absolutely new, Barre mentions the diminution or abolition of the cutaneous plantar reflex, definite modifications of the arterial tension and certain disturbances of the sensibility. Frequently percussion of the bony projection between the Achilles tendon and external malleolus for the purpose of exploring the retromalleolar reflex is less painful on the affected side than on the healthy side. This paradoxical fact helps to establish the reality of the sciatica. In every case in which Barre was unable to find any of the objective signs described, he was able to assert that there was simulation, to confute the malingerers and to obtain immediate or extremely rapid 'cures."—Medical News.

Cerebellar Abscess.—Dr. P. D. Kerrison (Laryngoscope) states that in so brief a paper it is only possible to enumerate the principal symptoms; that a full discussion of the subject is impossible. The article is so full of essential things that a review of it is difficult, and it is only possible to mention briefly the most essential points.

In cerebellar abscess the temperature runs along near the normal line with occasional variations from one to two degrees above to one degree below normal. The pulse is slow, falling to sixty, fifty or even forty. Headache varies, but if present it is more constant, more persistently severe and less variable in location than in cerebral abscess. Vomiting is common in the beginning of any brain lesion, and frequently recurs in cerebellar lesions. Insomnia, intractable and not amenable to opiates may be present. The patient is drowsy, but does not sleep. Mental lethargy and delayed cerebration are common and characteristic symptoms of temporal sphenoidal abscess, but are usually absent in cerebellar abscess. Unclouded mentality with signs of brain abscess speak for a cerebellar lesion. The eye symptoms may be unilateral or bilateral. Present or absent they are more common in cerebellar than in cerebral lesions. The patient lacks physical tone, is emaciated and presents ominous appearance of extreme illness. Movements of the head may cause pain in cerebellar abscess and the patient supports his head with his hands when he moves it. This symptom is not always present, but is very suggestive when it is seen.

Focal symptoms.—Nystagmus is variable as to direction and constancy, gradually increasing. Cerebellar ataxia. The patient tends to fall in one direction. Unilateral incoordination, diadokokinesis (Babinski) usually present. Pointing test on the affected side deviates outward. Past pointing. Nystagmus from turning, or irrigation gives past pointing in the opposite direction from the nystagmus, normally. In cerebellar abscess the hand on the side of the lesion continues to show a tendency to point outward regardless of the nystagmus. Spontaneous outward deviation of the arm and loss of normal vestibular reaction are pathognomonic symptoms of cerebellar abscess. Speech is usually slow and labored.

Recapitulation: Low grade sub-normal temperature, slow pulse, recurrent vomiting, persistent occipital headache, nystagmus of central origin, unilateral incoordination, speech defects, variation in the pointing and the past pointing test, with or without eye symptoms, all speak for cerebellar abscess.—Cleveland Medical Journal.

FRACTURE OF THE SPINE WITHOUT PARALYSIS.—Dr. W. G. Stern writes that fractures of the spine without paralyis are difficult to diagnose. The larger proportion of these fractures are without any cord symptoms. There are many varieties of isolated fractures of bodies, arches, transverse processes, and in combination with dislocation. They occur more frequently in men than in women, and are usually the result of direct violence; in this case they are confined to the spinous processes of the arches. The dorsal spinous processes are quite frequently torn off, due to indirect violence, or sudden muscular effort. When the fracture occurs by shortening of the longitudinal axis of the vertebral column, it is known as in indirect contusion. Fractures from compression are found in regions where a flexible portion of the spine joins a more fixed portion. Dislocation and rupture of the intravertebral ligaments are usually associated with fracture.

The refinements of the methods of diagnosis have convinced us that neurasthenia, railroad back, etc., must be abandoned. A safe road to follow is to hold all cases of injury to the back as fractures until proved otherwise.

Trauma of the back may be classified under four heads: (1) contusions, (2) sprains, (3) fractures, (4) dislocations. With contusions there is no fixation. In fractures and dislocations there is localized pain, tenderness and fixation in the segment involved. The spine is sore and weak. There may be an inequality in the spacing of the spines. The radiograph is the best and final arbitrator, as to the presence or non-presence of a fracture or dislocation. If a man receives an injury to his spinal column and complains of pain in some other point, or if the pain should persist one week after absolute rest in bed, then careful radiographic examination should be made. The radiograph is apt to be misleading, therefore always get a good ant-post, lateral and stereoscopic view.

Where there are symptoms of pain, loss of function, and inability to work, repeat the radiographic examination, since the repair is very slow and the formation of a true callus seldom takes place. To avoid kyphosis put patient on a bent gas-pipe frame to bring about extreme extension for three months, then put on a plaster cast or jacket. Dislocations are manipulated and put into a cast. If in any fracture normal function does not return after six to nine months of proper treatment, then an operative procedure should be considered.—Cleveland Med. Jour.

THE BARANY REACTION AS AN AID IN DIAGNOSIS AND TREATMENT.— Frank R. Starkey, M. D. (Therapeutic Gazette) writes:

In bringing forward this subject I, of course, do not make any claims to originality, inasmuch as our knowledge of intracranial localization is by no means satisfactory, although von Monokow, Sherrington, Mills, Spiller, and others have to some degree pointed out to us the reasons for some of our errors in diagnosing the location of cerebral and cerebellar lesions. Their work has thrown doubt upon what we supposed to be our most fundamental truths concerning the upper motor pathway and has caused us to realize that our conceptions of what seemed to be most thoroughly proven facts must change in the light of progress. This work of these investigators is scarcely less disturbing than was the overthrow of our conceptions of what we supposed to be for all time settled, the indivisibility of the atom. Now, thanks to the Curies, we know the atom to be a highly complex body. Therefore, we should welcome any addition that may increase our precision in this direction and feel especially grateful to Barany. The fact that his researches have been deemed worthy of the Nobel prize gives them an added dignity.

While we should not be stinting in our praise of Barany as a pathfinder, we must not forget that to the indefatigable work of Dr. Isaac Jones of Philadelphia, under the supervision of Drs. Charles K. Mills and William G. Spiller, we owe most of the exact knowledge that we now possess concerning the pathways by which we trace these vestibular phenomena and make them useful in localizing lesions.

The Barany reaction cannot by any means be considered infallible, but I believe that when fully understood and carefully worked out it will prove an additional link in our chain of diagnostic aids, which must be considered as we do the Wassermann and other modern tests, not singly but as a part of an entire complex, before we attempt to pass judgment.

Before accepting these findings we should make repeated examinations and should then not allow our enthusiasm to carry us astray, but always be conservative.

The physiology of the cerebellum has received much attention by students of the nervous system from the time of Petit, about 1710, to the present time, but our knowledge is still very chaotic, especially pertaining to localization of cerebellar lesions. Many signs and symptoms have been advocated for this purpose by eminent men, while diametrically opposite results were arrived at by no less careful and authoritative observers. Before we can attempt to make any use of the Barany reaction in localization of lesions, it is first necessary to understand the relation of the cerebellum to the rest of the nervous system, which is accomplished by certain afferent and efferent paths that pass through the superior, middle, and inferior peduncles, respectively. The fibers of the superior peduncles arise for the most part in the cells of the dentate nuclei, run forward to the mesencephalon, where most of them decussate beneath the corpora quadrigemina and terminate in the red nuclei. From the red nuclei fibers run to the optic thalami and are again relayed to the cortex. The superior peduncles also contain a few afferent fibers, according to Mingazzini, which probably arise in the thalami and pass through the red nuclei, decussating before reaching the superior cerebellar peduncles. The middle peduncles are mainly composed of afferent fibers to the cerebellum which arise in the cells of the pontine nuclei. They cross the median line of the pons and terminate in the cerebellar cortex of the opposite side. Since the cells of these crossed ponto-cerebellar fibers are in relation with the final ramifications of the fibers originating in the frontal and temporal cortices, it follows that each cerebral hemisphere is indirectly connected with the opposite half of the cerebellum by these fronto-temporo-pontine paths. According to Cajal, fibers from the Purkinje cells run through the middle peduncles, cross the pons, and then descend in the lateral column of the cord to terminate around the motor cells of the anterior horn. The inferior peduncles contain both afferent and efferent fibers, mainly afferent. Some fibers ascend from the cord and others from the medulla. They run in the lateral columns of the cord, forming the direct cerebellar tracts of Flechsig, which ascend hrough the restiform body to the vermis.

The technique of the Barany reaction or test is as follows: The turning test is performed by placing the patient in a smoothly revolving chair in which there is no vibration, and revolving it either to the right or left for, say, ten revolutions. In a normal individual with the head erect, this causes movement of the fluid in the horizontal canals, and if the head is inclined either forward or backward it produces a corresponding stimulation of the vertical canals. This stimulation of the semicircular canals produces through the nerve pathways to the eye a nystagmus of about 26 seconds' duration with the slow component to the side that is stimulated.

The caloric test is applied by douching the ear with water at 68° F. for a period of about four minutes. If the head is erect the vertical canals are stimulated, and if the head is inclined forward or backward the horizontal canals are then brought into the vertical plane and are stimulated. This stimulation depends upon movement in the fluid in the canals due to the cooler upper stratum falling, much after the fashion of the circulation in a radiator, and the nystagmus is produced by stimulation passing from the ear through the posterior longitudinal bundle to the nuclei of the sixth and that portion of the third nerve that enervates the internal rectus. This causes a conjugate deviation of the eyes, which is converted into a nystagmus by impulses from the cerebrum, which restore the eye to its normal position. In a person in deep narcosis stimulation of the semi-circular canals does not produce nystagmus, but a conjugate deviation, because the cerebral mechanism is eliminated by the anesthetic. The vertigo is produced by the stimulus from the ear passing through the cerebellum to the cerebrum. This causes a confusion resulting from the coming into consciousness of afferent and efferent impulses which are ordinarily integrated but become dissociated. The ear is the most important peripheral organ which sends such impulses efferentward, and any slight disturbance of the labyrinth results in confusion of the patient's conception of his position to space. The normal individual is aware of his position in space and can, without difficulty with his eyes closed, locate an object previously touched, as the examiner's finger held in front of him. When his ears are douched, however, or if he be turned in a smoothly revolving chair, he past points in a definite way. If cold water (68° F.) is used for douching the right ear, for instance, or if the patient is revolved to the right, he will past point to the right, and if hot water (112° F.) is used, or if the patient is rotated to the left, he will past point to the left. The patient's head should be held in a fixed position during these pointing tests. These same reactions are true of the wrist, elbow, foot, head, and trunk.

It seems that the pathways by which the stimuli are carried from the vestibular apparatus through the cerebellum to the cerebrum are by way of the inferior cerebellar peduncles for the horizontal canals and the middle cerebellar peduncles for the vertical canals, and, after passing through the cerebellum, they reach the cerebrum by way of the superior cerebellar peduncles. Nystagmus upward is caused by neuraxial lesion, which interferes with passage of impulses from the vertical canals, and these interruptions are usually produced by tumors of the cerebello-pontine angle, internal hydrocephalus causing pressure on the floor of the fourth ventricle, or tumors in the cerebellum causing pressure on the pons. According to Mills and his colleagues, the fibers from the horizontal canals have separate pathways from those of the vertical. Those from the horizontal are confined to the medulla and enter the cerebellum through the inferior peduncle, while the fibers of the vertical canals ascend into the pons and enter the cerebellum through the middle peduncle.

In any attempts to interpret the findings obtained from the Barany tests, we must first bear in mind that each reaction is dependent upon a definite arc, and that it is interruptions in the impulses passing through these arcs that cause variations from the normal, and upon our interpretation of these variations the value of the Barany reaction depends. While it is not so easy or simple to demonstrate the intactness of these arcs as it is the better known reflexes, such as the knee-jerk for instance, they are probably no less definite.

Although the author of these reactions was an otologist, and some of the most important work on them has been done by another otologist, namely, Jones, and the work has been clasped to the bosom of the otologists in general. I believe it to be more essentially the work of the neurologist than of the otologist and should be employed as part of our routine examination in all of our suspicious cases.

Since the above article was written my attention has been called by Dr. Emil Amberg to two articles of much historical value bearing on this subject, namely, "Labyrinth und Nystagmus," in Archiv fur Ohrenheilkunde, by Dr. Martin Sugar, and "Otologischer Teil," in Monatsschrift fur Ohrenheilkunde und Laryngo-Rhinologie, by Dr. Martin Sugar. These articles seem to prove that elaborate animal experiments were conducted by Dr. Andreas Hogyes as far back as 1881, which established the true function of the labyrinth and semicircular canals in relation to equilibrium. This, however, does not detract from the practical value of Barany's work.

NEURO-ETIOLOGY

Is Epilepsy a Bacterial Infection?—J. F. Munson (N. Y. M. J.) writes: Marie Bra first described an organism which she considered the etiological agent of epilepsy. Her claims were rejected by various workers and the subject did not come up again until re-opened by Reed, of Cincinnati, who has made positive statements in regard to the question, unsupported by definite scientific data.

During more than 20 years, over 4,250 epileptics have been cared for at the Craig Colony. In all this time not one fact has come to notice which would suggest that epilepsy is an infectious disease.

The author made blood cultures exactly according to the methods of Reed, but using every possible means to prevent contaminations. In each case blood was taken in two flasks. Of 131 cases tested all were entirely negative except one. In this single instance an organism corresponding in general to the Reed bacillus was obtained in one of the two flasks. A second culture was taken and was negative. Contamination occurred in 10 per cent of the flasks, showing the difficulty of preventing this in a large series of cases. From cultures taken from cecal material of 21 cases coming to autopsy or operation, four yielded a spore forming bacillus of the Reed type. Spore forming organisms in the intestinal tract are not unknown and the finding of such organisms in epileptics does not necessarily predicate a specific infection causing epilepsy.

The author has examined two strains of the bacillus epilepticus sent to him by Dr. Reed. They were found to bear an extremely close resemblance to the common hay bacillus. The organism is extremely resistant, growing after an exposure of fifty minutes at boiling heat, thus showing how easily contamination with this bacillus might occur under ordinary methods of sterilization.

From his work the author believes that the blood of epileptics does not contain a bacillus and that the spore bearing bacillus found in the intestines of epileptics occur also in the intestines of normal individuals and, therefore, cannot be considered as an etiological factor in epilepsy.—Cleveland Medical Journal.

NEURO-PATHOLOGY

Spinal Fluid Syndromes of Nonne & Froin.—Hanes (A. J. of Med. Sciences) directs attention to the significance of yellow color in spinal fluids. Froin's syndrome comprises the characteristics of yellow color, pleocytosis, and massive coagulability in the spinal fluid, while Nonne's syndrome is present when the spinal fluid shows a yellow color, no cells, and an excess of proteid. Subsequent observers have not been able to confirm Froin's findings of "numerous" cells. The dissociation of proteid excess and cellular increase is unusual, and xanthochromia is not a frequent occurrence, though Hanes has seen five instances in three years. Xanthochromia must be definitely distinguished from erythrochromia, where the color varies from bright red through varying shades of reddish brown to a dark yellow, due to the destruction of hemoglobin. With erythrochromia, the shade would vary at different punctures, while with xanthochromia the color is the same at each puncture. Then, too, with erythrochromia red blood cells or their shadows are apt to be numerous, and the fibrin content is low, showing radical differences from xanthochromatic fluids in both these points.

From a clinical standpoint, the clinical significance of obtaining a spinal fluid of yellow color, massive coagulation and high proteid content with or without high cell count is that it is always produced by a localized obliteration of the pia-arachnoid space. This space is divided into two portions, an upper one communicating freely with the pia-arachnoid of the brain and upper cord and a lower cul-de-sac. The author quotes Mix, who states that such a cul-de-sac may be isolated by a meningitis sealing the meninges at some point by a pachy-meningitis or a tumor exerting extradural pressure, or to an intradural tumor acting as a ball-valve. Hanes advances the theory that pleocytosis is present when the meninges are inflamed by the pathological process causing the compression.—Cleveland Medical Journal.

NEURO-THERAPY

AFTER-TREATMENT OF ANTERIOR POLIOMYELITIS.—Frauenthal (New York Medical Journal) says that treatment has a more hopeful outlook when we realize that less than ten per cent of the muscles are totally paralyzed and more than ninety per cent are simply paretic.

One should always carry in his mind the physiological effect of heat, hydrotherapeutics, massage, electricity, and muscle education (as herein described, performed before a mirror) in the treatment of cases of infantile paralysis.

The following salient points are worthy of repetition owing to their importance in treatment:

1. It is advisable to give all treatment early in the morning, the child being then in the best physical condition and having expended little of his recruited strength, which makes a good standard of comparison. The apparent condition of the child is to be noted as a basis to determine the amount of treatment to be given on that particular day.

2. Heating should be carried on to warm the muscle tissue, but not to manifest a perspiration that would be a physical tax. The warming of the skin requires less electrical current for reaction.

3. Massage should be given as a mild stimulant to the muscle and circulation, but not to exhaust the muscle tissue or to produce pain or irritation of the child.

4. In the administration of electricity, no matter what current is used, it should not be strong enough to give the child pain or act as an irritant. The least possible amount of current that will produce a contraction should be used, and not to a point of exhausting the muscle or until it ceases to contract.

5. In muscle education the exercises should be limited to a time that will not overtax the paretic muscle.

6. In the use of the bath, care should be taken not to have the heat of the water so high as to irritate the skin or to burn it.

7. The very best results, in Frauenthal's opinion, are obtained by administering treatment every other day, allowing the time intervening to recruit the muscle and the general health.—Therapeutic Gazette.

The Treatment of Acute Poliomyelitis.—Le Boutillier (American Journal of the Mecical Sciences) points out that while many drugs have been advocated and used there seems to be none which give marked results. Hexamethylenamin was used in all cases during the first two and a half months of the epidemic without apparent result, and was then discontinued. Tincture of nux vomica was used in many cases after the first week for its general tonic action without any bad effect, while in some cases the general condition of the patient improved. During the third and fourth week syrup of iodide of iron was used in a number of anemic children, with good result.

Lumbar puncture as a therapeutic measure must not be overlooked, as it is the one procedure from which is derived the greatest benefit. It should be done as often as the condition of the patient indicates; that is to say, from every twelve to every twenty-four hours in some cases; every three or four days in others, or only when increased pain and restlessness or irritability point to pressure by an increased amount of spinal fluid. By removing the pressure upon the congested portions of the cord this writer has seen cases recover from an apparent absolute paralysis of one or more extremities, which, of course, means there was only congestion and that the disease had not attacked or destroyed the nerve tracts. In other cases almost instant relief of pain followed lumbar puncture.

Adrenalin chloride in 1-to-1000 solution given intraspinally theoretically should be of great value because of its action upon the congested blood-vessels of the membranes and cord. Its use in doses of from 1 to 2 Cc. every six hours for several says has been advocated. This, however, Le Boutillier found caused marked disturbance, with vomiting in many cases, and every twelve to twenty-four hours was substituted. The results obtained were rather questionable, as it seemed impossible for the solution to reach the upper part of the cord if the seat of the lesion was high, even with the buttocks well elevated. This method of treatment, however, should not be given up until one showing decidedly better effect be discovered.

Normal human serum—that is, serum collected from healthy adults—was used in a few cases, but without result.

Immune serum, or that obtained from the blood of persons having suffered from acute poliomyelitis some months or years before, was used to as great an extent as possible. He was, however, handicapped by the comparatively small amount available, and by the fact that at first it was reserved for use in only the most desperate cases. Later on it was given to patients entering on the first or second day of the acute paralytic stage, and here some good resulted. It was given in doses ranging from 5 to 15 or even 30 Cc., either intraspinally, intravenously, or intramuscularly, daily or every two or three days, for several doses. At times a combination of adrenalin chloride in the morning and immune serum at night was used on consecutive days, with apparently better results than when given alone. In at least two very severe cases with chest involvement the improvement following this method of treatment was most marked. When, however, a severe toxemia is present, showing a marked general involvement, the intravenous use of the serum is especially indicated. When paralysis alone occurs the intraspinal method of administration seems to be most effective. The intramuscular method, he believes, should only be employed when it is impossible to give the serum into a vein, as the absorption is much slower. Another method of procedure when the toxemia is marked is the intravenous use of hypertonic salt solution, following the removal of an equal or smaller quantity of blood; the quantity removed varying from 5 to 30 Cc., depending upon the age and condition of the patient.—Therapeutic Gazette.

THE RATIONAL TREATMENT OF STUTTERING.—M. K. Scripture and E. Jackson (Laryngoscope) emphasize the following points:

1. There is no royal road to the correction of stuttering. It requires long and patient treatment on the part of the teacher and hard, conscientious work on the part of the pupil.
2. If properly treated at an early age, most stutterers can be permanently cured.
3. The longer a case has been permitted to go uncared for the more difficult will it be to eradicate the defect.
4. Adult stutterers may in many cases be cured and practically all cases may be so alleviated that the patient can get along quite well in the ordinary affairs of life.
5. Only such stutterers who have rid themselves of fear, be it fear of word, sound or situation, can be said to be permanently cured.

In conclusion these Ten Commandments of speech are offered:

1. Say to yourself, "I have no fear, I know that I can speak well."
2. Think before you speak.
3. Always speak quietly and calmly, with all the muscles relaxed.
4. Always speak slowly and carefully.
5. Stand and sit quietly and erect when speaking.
6. Before speaking inhale quickly, deeply and without straining, with mouth open.
7. Be very careful of the first two words in each sentence.
8. Always lengthen and strengthen the principal vowels.
9. Be especially careful to lengthen the short vowels.
10. Be honest with yourself. Do not try to avoid words that you think difficult.—Index of Oto-Laryngology.

THE TREATMENT OF SYPHILIS OF THE CENTRAL NERVOUS SYSTEM WITH INTRASPINAL INJECTIONS OF SERUM.—Wolfsohn (American Journal of the Medical Sciences) states that the facts of greatest interest to the neurologist in connection with the intraspinal mercurialized serum treatment are:

1. There is no danger in its administration.

2. For local treatment it is very efficacious in syphilis of the central nervous system, especially in the treatment of tabes dorsalis, in which lancinating pains are the predominant symptom.

3. Due to its stability the serum may be used at any time after its preparation.

4. The lack of expensive drugs used in its preparation makes it invaluable at this time.

5. There is no objection to a combined salvarsanized and mercurialized treatment.

6. It must not be concluded from the short space of time (eight months) that has elapsed since the beginning of this form of treatment in these cases that relief is going to be permanent. One will have to be cautious about prognosticating a cure until the proper length of time elapses, e. g., at least three years. From the results obtained so far it certainly has mitigated the symptom of pain.—The Therapeutic Gazette.

PSYCHOLOGY

THE PSYCHOLOGY OF FEAR. The Effects of Panic Fear in Wartime.—Hon. Major Sir Robert Armstrong-Jones, M.D. (late Medical Superintendent, Claybury County Asylum) says:

It is an acknowledged fact that in the whole annals of mankind the most eventful period of a nation's psychology is that during which its people is passing through the crisis of war; and the history of nations, from the earliest dawn of society, presents continuous records of warlike operations. Looked upon psychologically, war is the manifestation of a biological law, and it is the embodiment in men of a primordial and deep-rooted instinct. War is an instinct which is associated with the emotions of anger and hate, as well as of fear. Psychologists and physiologists now all teach that the emotions have very definite physical correlatives: Pawlow, Elliott, Cannon, Sherrington, Shand and

Crile have all urged this. The presentation to consciousness of visceral sensation was an early recognition. The Psalmist referred to it: "My bowels yearned within me;" "My tongue cleaved to the roof of my mouth." And we have frequent references to the organic sensations in the visceral perturbations, praecordial anxieties, rapid pulse, and "cold sweats" of shell-shock cases.

The Desire for Flight.—A young officer, who had obtained the Military Cross for bravery, told the author that on one occasion, when alone and in danger, he was overcome by a sudden fear: "something within me seemed to pass right away." Then his body began to tremble, but, by an effort of will, this passed off. Otherwise, his feeling was to get right away from where he was. In all dangers the effect is the same, and Crile states the whole effort of the organism is to obtain an "atmosphere" of "a-nosi-association," i. e., protective visceral reflexes occur, and these are precisely similar to those for combat or flight. Although the action of the central nervous system is of the syndromic variety, the cortex being organized and activated to a high degree of perfection upon a united basis, yet the mind may become dissociated and any one element may predominate.

Sensory-motor Disturbances.—Fear, especially of the vague, marginal, subconscious type, may effect this, and more so when the bodily defenses are lowered by stress and insomnia. Then any sudden, overwhelming cause, especially loud noises or sudden unexpected sounds, may bring about a dissociation, as is seen in so many shell-shock cases. Witness, for instance, the deaf and dumb who are even unable to whisper, those who may be said to be "struck dumb" by fear, or those who lose their sight and are "struck blind," yet who recover suddenly. And there are those who exhibit sensory-motor disturbances, and are seen in large numbers in the various military hospitals. In regard to sensory disturbances it is the most highly evolutionized and the least organized that soonest suffer dissociative dissolutions: hearing and sight, rather than taste and smell. As to sensory-motor disturbances, we realize that consciousness is a continuous dynamic process. The normal cortex is in a state of constant nervous tension, ready, at any instant, to discharge and respond to any stimulus, the most facile track being the most ancient as well as the most elementary —i. e., the lower motor neurones; so that when any disturbing stimulus arises, the co-ordination of all the usual intercurrent stimuli in the cortex is affected, and a discharge occurs along the easiest routes. Not infrequently this discharge excites other areas in more distantly related centres, the form of the discharge depending on the individual temperament or upon the readiness of innately organized areas to respond.

Stimulation by Noise.—Loud noises often act as disturbing stimuli because hearing depends upon very specific receptors, the delicate hair-cells to which the tectorial membrane resounds, and there is an intimate association between tactile and auditory sensations, as well as between motor and auditory; and any sudden stimulation of the specific auditory epithelium is capable of reacting, in a very general way, upon the mental functions. The stream of sudden stimuli to the auditory nerve must also affect its vestibular branch, which is closely connected with the static sense and with the control of movement. And although the vestibular nerves give rise to no sensations, they are nevertheless closely related to the roots of the motor-oculi nerves, as well as to the other motor centres in the medulla and cerebellum. They thus serve to keep up the bodily balance and to keep the eyes fixed upon the same point, in spite of movements of the head and body.

The Correlation of Auditory Impulses with Movements. —All auditory impulses, as well as visual, must therefore be continuously correlated with movements, yet there is no knowledge in consciousness that these movements are made or produced during normal hearing and seeing. A large number of shell-shock cases exercise uncontrolled movements, especially when suddenly spoken to; and this fear is often imitative, and may be excited through suggestion. A soldier suffering from shell-shock was out on parole when he saw a horse fall, and suddenly he went down too, and had to be carried back. An aeroplane pilot had a false landing and fell on his head. He was blind for three hours, and at intervals completely loses sight and feels dizzy, being unable to stand or walk, although there is no organic lesion. The extreme suddenness of the symptoms is only equalled by the extreme suddenness of their disappearance, which seems to suggest the assumption of some entity "mind." And the mental experiences of the war favor a view of interactionism, rather than of parallelism, as to the relationship between mind and body. A shell-shock case, deaf and dumb, walked up Parliament Street when he was suddenly greeted by his brother, whom he had not seen for several years, and he spoke from that moment. A group of cases went to witness a transpontine melodrama, part of the play being the explosion of a mimic shell on the stage. Five of their number had to be carried back, and one became aphasic and aphonic.

Views as to Cause of Shell-Shock.—As to the cause of shell-shock, although an indescribable, unknown fear is a preliminary condition, it is impossible to dogmatise when the symptoms are so variable. Crile has shown that in every case where psychic stimuli have been applied to excess experimentally by frightening caged animals with dogs, and by worrying rabbits, and keeping animals from sleeping for long periods, definite neuronic changes, commencing with hyperchromatism and passing into chromato-lysis, have been observed in the cerebrum, cerebellum, medulla, and cord: also in the cells of the liver, thyroid, and suprarenals, so that we may be said to fear in our visceral organs as well as in our brains. At least five views have been expressed as to the cause of shell-shock: (a) hypothyroidism, (b) hyperthyroidism, (c) the inhalation of poisonous gases such as carbon monoxide or phosgene, which cause a disintegration of the red blood cells and consequent haemorrhage, (d) a definite molecular physical injury, due to the exceedingly high pressure—sometimes positive, sometimes negative—from the explosion of shells. It is considered that the cerebro-spinal nervous system hangs loosely in a fluid bag, and any concussion would be communicated to the anterior horn cells and the fine cells of the intermediolateral tract sooner than to the posterior spinal root ganglia, which are protected by a dura mater sheath in the intervertebral spaces; and that there is consequent loss of movement rather than of sensation. This accords with experience. Also, the dissociation between the cerebro-spinal and the autonomic systems would bring about those sympathetic symptoms of dilated pupil, rapid heart, dyspepsia, precordial pains, and visceral perturbations so often seen. (c) There is also the sudden effect of an unexpected fear, terror, or fright acting without warning as a strong emotional shock. And there is no doubt, from experimental records, that a physiological, if not an organic, change occurs in the cytoplasm of the neurons, and such a shock would also cause this dissociation between the cerebro-spinal and autonomic systems with the symptoms already named.

Fear Necessary to Self-Preservation.—Fear connotes a mental state in which the future appears to dominate the present, whilst the actual present is a revived experience of the past, this experience being a painful one, and it is this revival that constitutes the emotion of fear. The power to experience fear is necessary to self-preservation, and it is met with in early conscious life as well as in animals; the most easily frightened member of the herd, caeteris paribus, having the best chance of survival. Fear acts as a tonic to some natures, and to most of our soldiers at the front their life without danger or peril or fear would be insipid and flat. Fear is of two kinds, the sudden "unconscious," indescribable reaction to danger, which is highly infectious; and the reasoned fear of the courageous man. It is the former that causes masses of people to experience panic, and it is this fear that is the most characteristic of shell-shock cases, who should not be treated together in groups of like cases, but, as has been wisely suggested, interspersed with "superoptimists."

The God Pan.—It is not generally appreciated that the word "panic" is derived from the god Pan, who was awful to behold, whose voice instilled terror, and who made armies to flee. There are records of panic fears from time immemorial during wars, pestilence, revolutions, financial crises, earthquakes, and fires; but the relevant instances are those of war, as in the records of Grote, Mommsen, and Biblical history. The subject has also interested sculptors. Artists have also endeavored to describe the emotions in attitudes characteristic of the instincts of terror, fright, horror, awe, reverence, and sympathy, and the author gave a number of instances in classical art.

Among the civil population, during any sudden crisis, the emotions of many, even of superior minds, crystallise round the feelings of the moment. More especially is this the case when danger is anticipated, as occurred among those whose minds had a psychopathic tendency during the Zeppelin raids, which only served as the occasion upon which the morbid element and the insane tendency reacted to fear.

Practically all cases of shell-shock, which the author maintains are caused through sudden, unconscious fears and awe, are quite restored if treated early.—Abstract of a paper read before the Medical Society of London, in The Hospital.

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This magazine must not be expected to print whole pages of commercially devised, fulsomely laudatory puffing of proprietary advertisements, prepared by non-medical commercial agencies who know nothing of the facts of therapeutics nor of the medical code of ethics. Some of the puffs are so far from the truth that they are an insult to medical intelligence and do more harm than good to worthy proprietaries.

Such proprietaries as we carry speak for themselves with physicians, especially when their composition appears. Our readers are discriminating judges of what they want.

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This magazine would be much indebted to its regular subscribers and advertisers if they would renew by direct communication with this office, especially in the United States, and not through news agents.

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EDITORIAL

THE CORRELATED ACTIVITIES OF THE COUNCIL OF NATIONAL DEFENSE AND THE ADVISORY COMMISSION, THE MEDICAL DEPARTMENTS OF GOVERNMENT, AND THE COMMITTEE OF AMERICAN PHYSICIANS FOR MEDICAL PREPAREDNESS.—Every physician as well as every other loyal citizen of America should be prepared to render active service to the Federal Government, remembering that the protection afforded by the Government has made it possible for its citizens to enjoy liberty, peace, and prosperity.

The avenues through which the most effective service can be rendered by members of the medical profession have taken definite and concrete form. Briefly, the plan is that all medical activities should cooperate with the Council of National Defense.

It would seem desirable at this time to state explicitly just what the Council of National Defense and its various agencies are.

The Council of National Defense was created by Act of Congress August 29, 1916.

"Sec. 2. That a Council of National Defense is hereby established for the coordination of industries and resources for the national security and welfare, to consist of the Secretary of War, the Secretary of the Navy, the Secretary of the Interior, the Secretary of Agriculture, the Secretary of Commerce, and the Secretary of Labor.

"That the Council of National Defense shall nominate to the President, and the President shall appoint, an advisory commission, consisting of not more than seven persons, each of whom shall have special knowledge of some industry, public utility, or the development of some natural resource, or be otherwise specially qualified, in the opinion of the council, for the performance of the duties hereinafter provided. * * *

"That the Council of National Defense shall adopt rules and regulations for the conduct of its work, which rules and regulations shall be subject to the approval of the President, and shall provide for the work of the advisory commission to the end that the special knowledge of such commission may be developed by suitable investigation, research, and inquiry and made available in conference and report for the use of the council; and the council may organize subordinate bodies for its assistance in special investigations, either by the employment of experts or by the creation of committees of specially qualified persons to serve without compensation, but to direct the investigations of experts so employed."

A committee of distinguished physicians was asked to present to the President names of medical men suitable for membership on the advisory commission. Dr. Franklin H. Martin, of Chicago, was selected.

The following statement was issued by President Wilson on the night of October 11, 1916, in announcing his appointment of the civilian advisory members of the Council of National Defense:

"The Council of National Defense has been created because the Congress has realized that the country is best prepared for war when thoroughly prepared for peace. From an economic point of view, there is now very little difference between the machinery required for commercial efficiency and that required for military purposes.

"In both cases the whole industrial mechanism must be organized in the most effective way. Upon this conception of the national welfare the council is organized, in the words of the act, for 'the creation of relations which will render possible in time of need the immediate concentration and utilization of the resources of the Nation.'

"The organization of the council likewise opens up a new and direct channel of communication and cooperation between business and scientific men and all departments of the Government, and it is hoped that it will, in addition, become a rallying point for civic bodies working for the national defense. The council's chief functions are:

"1. The coordination of all forms of transportation and the development of means of transportation to meet the military, industrial, and commercial needs of the Nation.

"2. The extension of the industrial mobilization work of the Committee on Industrial Preparedness of the Naval Consulting Board and complete information as to our present manufacturing and producing facilities adaptable to many-sided uses of modern warfare will be procured, analyzed, and made use of.

"One of the objects of the council will be to inform American manufacturers as to the part which they can and must play in national emergency. It is empowered to establish at once and maintain through subordinate bodies of specially qualified persons an auxiliary organization composed of men of the best creative and administrative capacity, capable of mobilizing to the utmost the resources of the country.

"The personnel of the council's advisory members, appointed without regard to party, marks the entrance of the nonpartisan engineer and professional man into American governmental affairs on a wider scale than ever before. It is responsive to the increased demand for and need of business organization in public matters, and for the presence there of the best specialists in their respective fields. In the present instance the time of some of the members of the Advisory Board could not be purchased. They serve the Government without remuneration, efficiency being their sole object and Americanism their only motive."

As indicated above the Council of National Defense therefore consists of six members of the Cabinet, as follows:

The Secretary of War, chairman.
The Secretary of the Navy.
The Secretary of the Interior.
The Secretary of Agriculture.
The Secretary of Commerce.
The Secretary of Labor.

The Advisory Commission of the Council of National Defense consists of seven civilians appointed by the President. The members of the Advisory Commission are as follows:

Mr. Daniel Willard, president of the Baltimore & Ohio Railroad, chairman.

Mr. Hollis Godfrey, LL. D., president of Drexel Institute, Philadelphia, Pa.

Mr. Howard E. Coffin, of Detroit (who is also chairman of the Committee on Industrial Preparedness of the Naval Consulting Board.)

Dr. Franklin H. Martin, of Chicago.

Mr. Bernard Baruch, financier of New York.

Mr. Julius Rosenwald, vice president of Sears, Roebuck & Co., of Chicago.

Mr. Samuel Gompers, president of the Federation of Labor.

The two bodies meet in joint session at frequent intervals for the purpose of considering problems relating to national defense.

The executive activities of the Council of National Defense are coordinated and carried out through the medium of the Director of the Council of National Defense, Mr. W. S. Gifford, and the chiefs of the various departments represented by the members of the Advisory Commission. Dr. Frank F. Simpson is chief of the Medical Section of the Council of National Defense.

THE ADVISORY COMMISSION

The organization of the Council and of the Advisory Commission provides that each member of the Advisory Commission shall gather about himself for the most effective coordination of the activities he represents a committee or board consisting of representatives of governmental departments on the one hand, and civilian members on the other hand.

The Medical Committee, of which Dr. Franklin H. Martin is chairman, consists of:

William C. Gorgas, Surgeon General of the United States Army;

William C. Braisted, Surgeon General of the United States Navy;

Rupert Blue, Surgeon General of the United States Public Health Service;

Col. Jefferson R. Kean, director general of military relief of the American Red Cross;

Dr. Wm. H. Welch, member of the National Council of Research;

Dr. Wm. J. Mayo, chairman of the Committee of American Physicians for Medical Preparedness;

Dr. Frank F. Simpson, Chief of the Medical Section of the Council of National Defense and Secretary of the Committee of American Physicians for Medical Preparedness.

Many medical problems which have bearing upon the national defense are considered by Dr. Martin's committee and by the Advisory Commission and the Council of National

Defense before being put into action by the governmental departments concerned.

COMMITTEE OF AMERICAN PHYSICIANS FOR MEDICAL PREPAREDNESS—ITS COMPONENT PARTS.

NATIONAL AND STATE COMMITTEES

In April, 1916, the national committee was appointed by the joint action of the presidents of the American Medical Association, the American Surgical Association, the Congress of American Physicians and Surgeons, the Clinical Congress of Surgeons of North America, and the American College of Surgeons. To that committee was delegated the responsible duty of formulating plans whereby the civilian medical resources of the United States might be ascertained and effectively coordinated for such purposes as might be required by the Federal Government.

The national committee organized, selected a chairman and secretary and an executive committee, and appointed a State committee of nine strong men in each State of the Union.

It is the fixed policy of this committee that all presidents and secretaries of the various State medical societies shall be members of their respective State committees during their incumbency in office. From the first it was contemplated that at the proper time the organization of committees would be perfected in each county of the country. That time has now come and county committees are being rapidly organized.

In each instance the State committees are expected to select the county committees and to supervise their formation.

NAME AND PERSONNEL OF COUNTY COMMITTEES

It is the fixed policy of the Committee of American Physicians for Medical Preparedness that the various important medical interest and activites of each county shall be represented on the county committees. This is done for the purpose of coordinating the important interests and activities so that the medical profession of the Nation may present a compact and effective organization for the purpose of aiding effectively in the national defense. In order that this plan may be carried out with uniformity and precision throughout the country the various State committees have been requested to have all county committees bear the following distinguishing name, to wit, The Auxiliary Medical Defense Committee of——— County, in ——— State. The State committees have also been requested to provide that the county committees shall include the following in their list of members:

1. All members of National Committee of the Committee of American Physicians for Medical Preparedness resident in the individual county.
2. Members of the State committee resident in or near the individual county.
3. Representatives of the United States Army resident in the individual county.
4. Representatives of the United States Navy resident in the individual county.
5. Representatives of the United States Public Health Service resident in the individual county.
6. Representatives of the State Board of Medical Examiners residing in the individual county.
7. Representatives of the State or City Public Health Service.
8. Ranking medical officer of the National Guard.
9. President and secretary of the local Medical Officers' Reserve Corps Association, if there should be such an organization.
10. Deans of Medical schools.
11. President and secretary of the County Medical Society.
12. President and secretary of any other important medical societies.
13. Medical Director of the local Red Cross units.
14. Other representative medical men.

Duties of County Committees

From time to time specific duties will be assigned to the various State and county committees. These duties will be in accord with the policy of the Council of National

Defense, and should be executed promptly and precisely by those who are called upon to cooperate in this manner with the Council of National Defense.

The committees will call to their assistance those who have been appointed field aids by their various State committees and such other physicians as they may desire to have cooperate with them.

Among the specific duties which the county committees are requested to perform at this time are the following:

First. That these committees cooperate with the National and State Committees of the Committee of American Physicians for Medical Preparedness in their efforts to gain needful information regarding the civilian medical resources of their own communities, and in their efforts to coordinate civilian medical activities for prompt mobilization in case of need.

Second. That they secure applicants:

(A) For the Army Medical Corps. If the President should call the full complement of troops already authorized by Congress, the Regular Army would need about 1,200 additional medical officers. If a million men should be called, a corresponding increase would be required.

(B) For the Medical Officers' Reserve Corps. If war should come, 20,000 to 30,000 Medical Reserve officers should be enrolled.

(C) For the Naval Medical Corps, which needs about 350 additional officers.

(D) For the Coast Defense Reserve Corps of the Navy. Several hundred high-class reserve medical officers are desired.

(E) For the National Guard, such numbers as may be required to bring your local National Guard to full strength.

In the preparation for National Defense the first thing needed will be medical officers.

Physicians recommended for such service should be of the highest type. They should be free from suspicion of addiction to drugs or drink.

Medical Officers who go to field duty should by preference be under the age of forty-five.

Third. That they cooperate, individually and collectively, with the Medical Department of the Army, Navy, and Public Health Service, and with the Council of National Defense.

Fourth. That they cooperate with the Red Cross in their efforts to bring that organization to the highest point of efficiency.

COMMITTEE OF AMERICAN PHYSICIANS—ACTIVITIES ACCOMPLISHED AND IN PROGRESS

On the 26th of April, 1916, the Executive Committee of the Committee of American Physicians tendered the services of the committee to the President of the United States. He expressed himself as being pleased with the patriotic tender of services and regretted that existing laws did not permit the acceptance by the Federal Government of gratuitous services, but stated that the matter would be referred to the Secretary of War and the Secretary of the Navy for the purpose of devising plans by which the good offices of the medical profession could be accepted and utilized to best effect by the Federal Government. He further stated that the plans would be referred to the Committee of American Physicians for comments and suggestions. The Executive Committee was permitted to make suggestions regarding the bill creating the Council of National Defense.

During the last year this committee and its various subsidiary bodies have been actively engaged in formulating and carrying out various activities in conformity with the general plans for national defense which have been undertaken by the Federal Government.

The splendid work done by the various State and other committees was of such extent and value that the Council of National Defense at its first meeting requested the Committee of American Physicians to continue their various activities under the guidance of the Council of National Defense, and asked the secretary of the Committee of American Physicians to act as chief of the Medical Section of the Council of National Defense. Since that time the various activities have gone forward with renewed energy.

Some of the activities which have either been completed or are well under way follow:

First. Some 20,000 medical men selected from all parts of the country have been classified according to the training and the kinds of work which they do best.

Second. An inventory of hospitals and other medical institutions is well under way.

Third. It has been the fixed policy of the Committee of American Physicians to aid the American Red Cross in bringing its medical department to the highest point of efficiency. With that object in view and in order to foster the spirit of cooperation the members of the National Committee of the Committee of American Physicians accepted invitations to become members of the national committee of the medical department of the American Red Cross. In order further to promote the harmonious cooperation of the two organizations most of the members of the various State committees of the Committee of American Physicians were also made members of the State committees of the American Red Cross. The various county committees will also be expected to cooperate in carrying out the plans of the two organizations.

Fourth. The establishment of military training for senior medical students in a large percentage of the high-grade medical schools of the country.

Fifth. The establishment of more effective military training for hospital groups for members of the Medical Officers' Reserve Corps, for dental students, and others.

Sixth. The appointment of a Committee for the Standardization of Medical and Surgical Supplies and Equipment. The purpose of this work is to designate a list of articles essential to the successful conduct of civilian and military medical and surgical activities so that in the event that it should become necessary to curtail production, all of the energies of the drug and instrument makers would be devoted to necessary articles rather than to those which are desirable but not essential. On this Standardization Committee are representatives of the Army, the Navy, the Public Health Service, the Red Cross, the Council of National Defense, and a number of the most distinguished members of the various specialties of civilian medicine. In their work of coordination and standardization this committee will take council with the manufacturers of the various supplies under consideration.

Seventh. Much valuable information supplied by medical and other observers who have worked in the war zones of Europe is being gathered and classified.

Eighth. The presidents of important national medical organizations of the country have been requested to suggest to the medical section of the Council of National Defense the kinds of work which members of those organizations are best fitted to perform and to suggest plans whereby their activities and resources might be utilized to best advantage. This request does not contemplate an inventory and organization of these resources. The purpose is that having received suggestions offered by the various organizations, those suggestions will be maturely considered, and such as conform to the plans of the Council of National Defense and can be utilized to advantage will be adopted. The various organizations will, in that case, be requested to cooperate fully and promptly in perfecting the plans of the Council of National Defense.

The foregoing memorandum embodies only a very small percentage of the problems now under consideration.

INFORMATION RELATING TO APPOINTMENTS IN THE MEDICAL RESERVE CORPS SECTION OF THE OFFICERS' RESERVE CORPS OF THE ARMY.

Under the new regulations for the examination of candidates for appointment in the Medical Reserve Corps Section of the Officers' Reserve Corps of the Army, the candidate is required: First, to submit his application in writing to the Surgeon General of the Army; Second, the application should be accompanied by two testimonials; and, Third, the Personal History blank, properly filled in as directed thereon, after having the same certified to before a Notary Public.

The requirements for appointment are that the applicant be a citizen of the United States, between 22 and 55 years of age, a graduate of a reputable medical school legally authorized to confer the degree of doctor of medicine, he must have qualified to practice medicine in the state in which he resides, and be in the active practice of his profession.

The examination is physical and professional; the professional examination to be oral, except in case of failure, when it will be written. Such written examination will be in the following subjects:

1. Practice of medicine, including etiology, clinical description, pathology, and treatment of diseases.
2. Surgery—principles and practice.
3. Obstetrics and gynecology.
4. Hygiene—personal and general, especially as to the prophylaxis of the more prevalent epidemic diseases.

Specialists will be examined in their specialty.

Commissions are issued for a period of five years, at the end of which time officers may be recommissioned in the same or higher grades, that is, first lieutenant, captain, and major.

The Act of June 3, 1916, creating the Medical Reserve Corps Section of the Officers' Reserve Corps of the Army, provides that in time of peace only those of the grade of first lieutenant may be ordered to active duty, and this with their own consent, but in time of war the services of officers of all grades are at the disposal of the Government.

GENERAL MEDICAL BOARD OF THE COUNCIL OF NATIONAL DEFENSE, WHICH IS CONSTITUTED AS FOLLOWS:

Dr. Franklin Martin, Member of Advisory Commission, Council of National Defense, Chairman.

Dr. F. F. Simpson, Chief of Medical Section, Council of National Defense, Vice-Chairman.

Dr. Frederic A. Besley, Professor of Surgery, Northwestern University, Chicago, Secretary.

*Surgeon General William C. Gorgas, U. S. Army.

*Surgeon General William C. Braisted, U. S. Navy.

*Surgeon General Rupert Blue, U. S. Public Health Service, President American Medical Association.

*Col. Jefferson R. Kean, Director of Military Relief, American Red Cross.

*Dr. William H. Welch, Professor of Pathology, Johns Hopkins Hospital, Baltimore.

*Dr. William J. Mayo, Rochester, Minnesota.

*Dr. Victor C. Vaughan, Dean of University of Michigan, Ann Harbor, Michigan.

Dr. Herman M. Biggs, State Commissioner of Health, New York City.

Dr. George Brewer, Professor of Surgery, University of New York, New York City.

Dr. John Young Brown, Professor of Surgery, University of St. Louis, St. Louis, Mo.

Dr. George W. Crile, Professor of Surgery, Western Reserve University, Cleveland.

Dr. Edward P. Davis, Professor of Obstetrics, Jefferson Medical College, Philadelphia.

Dr. John M. T. Finney, Baltimore, Md., Professor of Clinical Surgery, Johns Hopkins University.

Dr. Simon Flexner, Director, Rockefeller Institute, New York City.

Dr. Joseph M. Flint, Professor of Surgery, Yale University, New Haven, Conn.

Dr. Thomas W. Huntington, Professor of Surgery, University of California, San Francisco.

Dr. Theodore Janeway, Professor of Medicine, Johns Hopkins University.

Dr. Edward C. Kirk, Dean of Dental Department, University of Pennsylvania, Philadelphia.

Dr. Stuart McGuire, Professor of Surgery, University of Virginia, Richmond, Va.

Dr. Edward Matin, Professor of Surgery, University of Pennsylvania, Philadelphia.

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*Member of Executive Committee of General Medical Board of Council of National Defense.

Dr. Charles H. Mayo, President-elect, American Medical Association, Rochester, Minn.

Dr. Charles H. Peck, Professor of Surgery, Columbia University, New York City.

Earl Phelps, Sanitary Engineer, Washington, D. C.

Dr. Hubert A. Royster, Secretary of Southern Surgical Association, Raleigh, N. C.

Dr. George H. Simmons, Editor, Journal of American Medical Association, Chicago.

Dr. Winford Smith, Superintendent, Johns Hopkins Hospital, Baltimore, Md.

Dr. Richard P. Strong, Professor of Tropical Medicine, Harvard University, Boston.

Dr. George Walker, Johns Hopkins University, Baltimore, Maryland.

Dr. W. C. Woodward, Health Officer of the District of Columbia, Washington, D. C.

STATE COMMITTEE OF NATIONAL DEFENSE
MISSOURI

W. J. Frick, Chairman, Rialto Bldg., Kansas City.

J. Franklin Welch, Pres. State Med. Soc., Salisbury.

Edward J. Goodwin, Sec., State Med. Soc., 3517 Pine St., St. Louis.

Robt. E. Schlueter, President-elect., State Med. Soc.

J. A. B. Adcock, Sec. State Board of Health of Missouri (which is also examining board), 325 E. High St., Jefferson City.

Willard Bartlett, Metropolitan Bldg., St. Louis.

*J. F. Binnie, Rialto Bldg., Kansas City.

John Y. Brown, Metropolitan Bldg., St. Louis.

M. B. Clopton, Humboldt Bldg., St. Louis.

W. W. Duke, Waldheim Bldg., Kansas City.

Roland Hill, 4500 Olive St., St. Louis.

*John R. Hume, Doniphan.

Jabez N. Jackson, 12th and McGee Sts., Kansas City.

*Joseph W. Love, Woodruff Bldg., Springfield.

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*Examiners.

*William H. Luedde, Metropolitan Bldg., St. Louis.

*Daniel Mortin, St. Joseph.

F. L. McCallum, Lathrop Bldg., Kansas City.

*James R. McVay, Trenton.

Fred. T. Murphy, Euclid Ave and Kingshighway, St. Louis.

*M. P. Ravenel, Univ. of Missouri, Columbia.

*The Surgeon, Jefferson Barracks.

*F. J. Tainer, St. Charles.

C. H. Wallace, 301 N. 8th St., St. Joseph.

Col. Thomas V. Raymond, in charge Medical Supply Depot, St. Louis.

Maj. H. F. Pipes, Chief Surgeon Jefferson Barracks.

Dr. Jno. Young Brown, Member General Medical Board of the Advisory Commission of the Council National Defense.

Dr. Marc Ray Hughes, Representative of the State Board of Health.

Dr. Max Starkloff, City Health Commissioner.

Dr. Cleveland H. Schutt, Hospital Commissioner.

Dr. Roland Hill, member and

Dr. E. J. Goodwin, Secy. Mo. State Med. Association.

Dr. Philip Schafer, Dean Washington University.

Dr. Hanau W. Loeb, Dean St. Louis University.

FOR ST. LOUIS

Dr. Fred T. Murphy, Surgeon in charge Base Hospital No. 21. Organized under Red Cross Society, of Barnes Hospital.

Dr. Harvey G. Mudd.

Dr. W. H. Luedde, representing the Medical Officers' Reserve Corps, U. S. Army, in St. Louis.

MISSOURI WORKMEN'S COMPENSATION CONFERENCE.—The Forty-ninth General Assembly of Missouri adjourned on March 19, 1917, without having enacted a Workmen's Compensation law, although the platforms of all the political parties promised it. This year such laws were enacted in

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***Examiners.**

Delaware, Idaho, New Mexico, South Dakota and Utah, making a total of 37 of the United States which are now under compensation laws and leaving Missouri the only large industrial state without one.

The bill drawn by the Missouri Workmen's Compensation Conference was Senate Bill No. 17 and House Bill No. 249. It was among the first bills introduced in both houses, and was practically the only compensation bill before the General Assembly.

The Senate Bill was never acted upon, and was forced out of the Senate Committee after it had been in their hands for 54 days without action. The usual method of defeating a bill in the Senate is to keep it in Committee and not report it out until it is too late to be passed. Late in the session Senator Gardner introduced two state insurance bills, one following the Washington law, and the other the Ohio law, and later Senator Bates drafted a committee substitute for Senator Gardner's bill along the lines of the Ohio law. No attempt was made to pass these bills and they were used chiefly to defeat the conference bill.

The House Committee made a favorable report on the House Bill, but on February 23, 1917, it failed of engrossment by a vote of 54 to 65, chiefly because most of the friends of the bill had not returned from the Washington's Birthday holiday. This action caused such a protest that on February 27 it was reconsidered by a vote of 135 to 1, and on March 1, 1917, the bill was engrossed with a few amendments by a vote of 123 to 7. It passed the House on March 5, 1917, by a vote of 120 to 11. It then went to the Senate, and after delaying the bill on various excuses, the Senate Committee reported it unfavorably on March 14, 1917. Under the rules of the Senate this deprived the bill of a place on the Senate calendar, but a motion to place it on the calendar notwithstanding the adverse report was immediately sustained by a vote of 20 to 13. This placed the bill at the bottom of the calendar, where there was no hope of reaching it before adjournment, unless it could be taken out of its regular order by a suspension of the rules, which required two-thirds of the senators, or 23 votes.

Several attempts to do this were defeated by parliamentary tactics, and though the friends of the bill were reasonably sure of 25 votes on final passage, they were unable to muster the 23 votes necessary to consider the bill out of its regular order, and the bill died on adjournment near the foot of the Senate calendar.

Owing to their newness and the fact that they deal with a technical subject, it is easy to convey erroneous impressions about compensation laws, and this is one of the main reasons for the defeat of the bill. By flooding the State and the Legislature with fallacious arguments the opposition succeeded in creating erroneous impressions which could not be corrected in the short time at hand. They also succeeded in having two unsound amendments adopted in the house, which may have been responsible for a small part of the opposition in the Senate. One of these amendments made the employer pay the same amount for a death without dependents as was required where the employee left persons totally dependent upon him for support. Every other compensation law makes the employer liable for only the burial expenses of an employee with no dependents, and under the decisions of the courts of this State nothing can be recovered at all in such cases. The other allowed the injured employee to choose his own physician, which is not permitted under the compensation law of any other state, and is contrary to the conclusion reached by the Missouri State Medical Association after a thorough investigation and discussion. The bill was actively opposed by the damage suit lawyers, with whom were aligned a few representatives of the Building Trades Councils of St. Louis and Kansas City, and a few employers' associations. It had the support of over 90% of the labor unions of the state, of many employers' associations and individual employers, the State Medical Association, the State Insurance Federation, and the State Bar Association, and was actively supported by the principal newspapers of the State.

The success of the Conference was impaired by the slowness of many employers in entering into its work. The bill as drafted by the Conference was in the hands of everybody over a month before the General Assembly convened, and the conference was kept open to meet objections, and many of the objections could have been met had they been presented to the conference before the bill was introduced.

The friends of compensation feel very much encouraged at the results accomplished. Though such bills had been before two previous legislatures, they never came to a vote, and this bill actually passed in the House, and would have passed in the Senate if it could have been brought to a vote. The publicity campaign of the conference and the discussions provoked by the bill have brought about a better understanding of the subject, and in time will bear fruit in the passage of a good law. In the meantime, as the result of our work, thousands of widows and injured employees, who never before knew their rights, will receive compensation for their injuries which would not otherwise have been paid, and thousands of fair-minded and enlightened employers will pay in cases where they would not have been previously inclined to pay. There will be less ignorance, fewer inadequate settlements, and a changed feeling towards industrial accidents.

Shortness of space prohibits mentioning the names of those members of the General Assembly who so valiantly championed the bill, and of the newspapers and boosters who worked so hard for it, but we assure them one and all that their efforts will be remembered and appreciated, and that they have the lasting gratitude of all of the friends of Compensation.

The American Society for the Study of Alcohol and Other Narcotics.—The forty-seventh annual meeting of this Society will be held in the parlors of the National Temperance Organization in the United Charities Bldg., 105 East 22nd St., New York City on June 6th, 1917, at 11:00 A. M.

This Society was organized in 1870 and was the first medical association in the world to take up the scientific study of alcohol and other narcotics. The purpose is to determine, from clinical experience, statistical facts and laboratory researches, the physical and psychical laws which govern the growth and development of the drink and drug addictions.

A group of very interesting papers presenting the very latest facts and studies will be offered. The following is a brief outline of many of the papers, with their authors, which will be presented on this occasion:

A preliminary report of some of the work done in the Hartford Research Foundation, will be presented by—Dr. T. D. Crothers, Sec'y.

Relation of Alcoholism to Epilepsy—Dr. Albert Gordon, Philadelphia, Pa.

The Influence of Alcohol on Military Efficiency—Dr. J. H. Benton, Miami, Fla.

Psycho-Therapy in the causes and treatment of Alcoholism—Dr. A. H. Burr, Chicago, Ill.

Some new phases of Psycho-Therapy—Dr. J. A. Quackenbos, New York City.

Drug Neurosis—Dr. E. S. Bishop, New York City.

Racial Influences by Tobacco—Dr. D. H. Kress, Washington, D. C.

Papers are promised by Doctors Carter, Emerson, Bowers, Goldwater and others. A president's address by Dr. Carter and a historic review by Dr. L. D. Mason will be given.

The Secretary, Dr. T. D. Crothers of Hartford, Conn., invites correspondence from anyone interested in a scientific study of this subject.

THE NATIONAL COMMITTEE FOR MENTAL HYGIENE has created a subcommittee on furnishing hospital units for nervous and mental disorders to the United States Government, the project having been approved by Surgeon General W. C. Gorgas of the U. S. Army.

This subcommittee, of which Dr. Pearce Bailey of New York is chairman, is authorized to secure the services of alienists and neurologists to be commissioned in the Officers' Reserve Corps, Medical Section, and to serve in the neuropsychiatric units which are to be attached to the base and other hospitals of the military services of the United States. Further information will be given, and application forms sent to physicians qualified in this branch of medicine, on application by letter or in person to The National Committee for Mental Hygiene, 50 Union Square, New York City.

THE WEDDED PRIESTHOOD.—The Catholic Church is contemplating receiving into its folds married priests after the war owing to the death of priests from that cause. The fact is as we understand it, Rome has allowed married priests to take the final vows if they were married before taking the major orders.

Why should priests be compelled to live in celibacy? We do not believe the unmarried man in ordinary life is more proficient in his calling than the married. Marriage life is a natural condition. Physiologically and psychologically it is the normal state, therefore why not right? Anything that is physiologically and psychologically natural is right. In other words, Nature is Nature whether it be doctor, lawyer, merchant, chief or even priest.

CHINESE OBJECT TO GERMAN "KULTUR."—We can not help remarking on the attitude China took when approached by Admiral Von Hintze to persuade the Premier of China to remain neutral and friendly to Germany. Among the baits held out to China was Germany's super-knowledge of doing and of obtaining materials for munitions of war. The using of their dead soldiers to extract from them glycerine to fire back at the enemy did not impress the Chinese Premier favorably as the Admiral thought.

It evidently seemed a travesty on civilization, rather than Kultur to the Chinaman as evinced by China's break with the Kaiser.

GOV. COX OF OHIO HAS APPOINTED A STATE HOSPITAL COMMISSION.—The duty of this Commission is to look into the present laws regulating medical licenture and education. The laws regulating the treating of the sick other than medical and the laws regulating the hospitals of the state. This commission is to make a report upon its findings. Some other than medical men were named on this Commission.

WHAT IS LOVE?—A short time ago, a local daily offered a cash prize for the best definition of love, to contain not more than twenty-five words. In response to personal requests for a definition from a psychological standpoint, we found the definition might be variously expressed, but give the following as perhaps the most comprehensive—if not the most comprehensible:

Love—An indescribably delicious feeling kindled involuntarily by pleasurable sensations; fanned by caresses; inflamed by fondling; raged by scorn; smoldered by indifference, and quenched by neglect.

Glossary—"Feeling" is used in its psychological sense as pertaining to the sentiments and emotions, and not to sense perceptions; "caress" is to express affection by words and actions; "fondle," to handle tenderly. D. S. B.

RESOLUTION OF THE AMERICAN SOCIETY FOR THE CONTROL OF CANCER.—A letter recently received by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce, Washington, D. C., from Mr. Curtis E. Lakeman, executive secretary of the American Society for the Control of Cancer, conveys the information that the National Council of that society, at its meeting at the Harvard Club, New York City, unanimously adopted the following resolution:

"Resolved, That the American Society for the Control of Cancer strongly commends the action of the U. S. Bureau of the Census in publishing its notable report on the mortality from cancer in the U. S. Registration Area in 1914, and records its appreciation of the courteous cooperation of the Director of the Census and all the members of his staff who contributed to the compilation of this unique volume, which represents an unparalleled contribution to the statistical study of malignant disease, and has already furnished the basis for many promising special investigations."

Dr. Tom A. Williams of Washington, D. C., leaves shortly for France in the French Service to return in the fall of 1918. Dr. E. S. Mitchell of 15 7th St., N. E., Washington, D. C., will have charge of his patients.

Program of the Sixth Annual Meeting of the Alienists and Neurologists of America (Auspices of the Chicago Medical Society), Hotel LaSalle, Chicago, Illinois, July 10, 11, 12, 1917. Dr. George A. Zeller, President; Dr. Bayard Holmes, Secretary.

Presiding Officers

Dr. George A. Zeller will preside at all sessions of the Society except as he may appoint temporary chairmen or yield to such appointments already listed on the program. Among the latter appointments are:

Dr. W. T. Mefford, founder of this Society, who will preside on Tuesday afternoon from 2:30 to 5:30 p. m.

Dr. H. Douglas Singer will preside at the morning session, Wednesday, July 11, at the discussion of syphilis and epilepsy.

At the meeting devoted to the discussion of Military Psychoses on Wednesday afternoon the chairman will be appointed from among the medical officers present.

Dr. Charles Humiston, President of the Chicago Medical Society, will preside at the joint meeting of Alienists and Neurologists with the Chicago Medical Society on Wednesday evening, July 11th.

Miss Miriam E. Carey, Supervisor of Institution Libraries, State Board of Control of Minnesota, will preside at the meeting Thursday afternoon, July 12th, from 2:30 to 5:30 p. m.

PROGRAM

Tuesday Morning, July 10th, 9:30 A. M. to 12:30 P. M.

The President's Address—Dr. George A. Zeller.

Mr. James B. Dibelka, State Architect, 130 North Fifth Avenue, Chicago. The State Colony for Epileptics. Exhibition of charts and drawings. (30 minutes.)

Introductory description of location and legislative act of the Illinois State Colony for Epileptics at Dixon, Illinois.

Buildings divided into four groups: Group 1, Utility and administration buildings; Group 2, cottages for the best class of patients; Group 3, one-story cottages; Group 4, buildings for custodial patients. Detailed description of arrangement and structure of buildings.

Mr. J. Meyer Sturm, 116 South Michigan Avenue, Chicago. The Social Aspect of the Hospital. (30 minutes.)

Dr. H. Douglas Singer, Superintendent, State Psychopathic Institute, Kankakee, Illinois. The Care of the Chronic Insane.

The danger of over-emphasizing the "hospital idea" and thus neglecting the very real problem of providing a "home" for persons unable to succeed under ordinary social conditions. Consideration of the problem of grouping and the proper provision of occupation and the means of recreation.

DISCUSSION

Dr. L. Vernon Briggs, 64 Beacon Street, Boston Massachusetts. Organization and Conduct of the Problem of the Mentally Ill in Massachusetts.

Relation of the Massachusetts Commission on Mental Diseases to the various State Hospitals and Schools for the Feeble-minded. Boards of Trustees of various institutions; their relation to the Commission on Mental Diseases and to their own institutions. District out-patient service and boarding out in connection with State Hospitals and Schools for the Feeble-minded. Full control of private institutions by the State Commission under the law of 1916.

Dr. Herman N. Adler, 116 South Michigan Avenue, Chicago. Complete State Organization for Mental Hygiene.

Dr. Sidney D. Wilgus, Wilgus Sanitarium, Rockford, Illinois. The Medical Care of the Insane.

The objections to be attached to the fads and fancies of extremists. The injury done helpless unfortunates through reckless handling of this problem. Object of State Hospitals is to provide places for the proper treatment of the insane. What is meant by proper treatment. What constitutes a medical, nursing and attendant standard to meet the minimum requirements.

Dr. Frank P. Woodbury, 717 Bulletin Building, Philadelphia, Pennsylvania. State Care for the Indigent Insane in Pennsylvania.

Dr. J. H. Smith, State Hospital, Anna, Illinois. The State Hospital and the Public Health.

Dr. B. F. Williams, Hospital for the Insane, Lincoln, Nebraska. Psychic Stress in Hospital Life.

No person can enjoy the peace and happiness of health who has not developed rhythmical regularity in habits, the results of which are full and complete bodily function and freedom from disease. The interdependency of physical and mental health is conceded. Recreation and social intercourse occupy a definite percentage of the cycle of all persons' lives and are important factors in the extra-hospital life which makes for physical health. Modern hospital care must give first consideration to vocational pursuit and recreation.

DISCUSSION

TUESDAY AFTERNOON PROGRAM, JULY 10TH, 2:30 TO 5:30 P.M.

Presiding Officer, Dr. W. T. Mefford, Chicago, Illinois.

Mr. William Hawley Smith, Peoria, Illinois. Author of "All the Children of All the People," "The Evolution of Dodd," etc. Born Long and Born Short.

Dr. S. N. Clark, State Psychopathic Institute, Kankakee, Illinois. The Criteria of Defective Mental Development.

Defective mental development ordinarily demonstrated by formal intelligence tests or recognized following infringement of statutes. Danger in fact that recognition of defect often occurs only after crime is committed. Need for contributions to the topic. Report of case in which lack of broad grasp and failure to consider more than immediate consequences of actions point to defect, although formal tests fail to prove retardation. Advisability of considering such cases in terms of adaptability to the problems of existence.

Dr. H. Campbell Stevens, 25 East Washington Street, Chicago. The Causes of Feeble-mindedness.

Two radically different conceptions of the mode of origin of amentia are now held by representative writers on the subject. E. Ray Lankester held that feeble-minded individuals were atavistic reversions to primitive pre-human ancestors. Contemporary biologists have attempted to apply the Mendelian law of inheritance to the occurrence of aments. Opposed to this view is the conception of amentia as the result of organic disease of the body. Wilmarth's observations. Hickson's observations. Syphilis is responsible for at least 15 per cent of all cases. Alcohol as an important factor in the causation of feeble-mindedness.

Dr. Edward F. Leonard, 25 East Washington Street, Chicago. Pictures of Two Cases of Myxedema. Exhibition of charts, etc.

One case recovering under thyroid treatment, the other case under thyroid medication presenting symptoms of exophthalmic goiter, and returning to nearly normal condition on withdrawal of treatment.

Dr. Harrison L. Harley, State Psychologist, Lincoln, Illinois. Some Observations on the Operation of the Illinois Commitment Law for the Feeble-minded.

Discussion

TUESDAY EVENING PROGRAM, JULY 10TH, 8:30 TO 10 P. M. Each paper to be illustrated with moving pictures and lantern slides.

Dr. William Sharpe, 20 West Fiftieth Street, New York, City. The Operative Treatment of Selected Cases of Cerebrospastic Paralysis Due to Intracranial Hemorrhage.

Patients with cerebrospastic paralysis have been the bane of existence to the general practitioner, the neurologist and the orthopedist. The three main causes of spastic paralysis are agenesis of the cerebral cortex, an earlier meninge-encephalitis, and an intracranial hemorrhage. Only in the last named cases can any marked improvement be obtained by an operative procedure. Performing a decompression as early as possible causes a marked improvement. Analysis of 1,400 cases observed.

Dr. E. Bosworth McCready, 909 Keenan Building, Pittsburg, Pennsylvania. Mentally Impaired Children: Their Training and Education.

The problems involved are so largely the result of abnormal physical states that the physician, rather than the layman, should have the supervision of this work. It seems proper that this work be delegated to one who is able to confine his interest to this special field. "Paedology" defined.

Proper hygienic influences are of the utmost importance. As adjuncts must be used, all agencies capable of improving metabolism and nutrition, and, incidentally, nerve tone. Measures especially calculated to promote psychomotor control must be utilized. The puely medical aspect is most important.

Dr. Thomas H. Leonard and Dr. Harrison L. Harley, Lincoln, Illinois. Important Social Aspects of Feeble-mindedness. DISCUSSION

WEDNESDAY MORNING PROGRAM, JULY 11TH, 8:30 A. M. TO 12:30 P. M.

Presiding Officer, Dr. H. Douglas Singer.

Dr. Barnett Lemchen, State Hospital, Dunning, Illinois. Etiology of General Paralysis.

General paralysis is due to previous syphilitic infection which, destroying too many of the spirochitae, liberates more toxin than the body can dispose of without severe injury at the time of infection. Effect of the spirochitic activity upon the nervous system. Duty of the physician to warn patient of the ravages of syphilis upon the central nervous system.

Dr. Harold N. Moyer, 202 South State Street, Chicago, Illinois. Treatment of Syphilis of the Nervous System.

Syphilis of the nervous system is understood to include paretic dementia and tabes. A brief historical introduction, followed by a description of present methods, with remarks on the too prevalent scepticism regarding the value of specific therapy in the management of neural syphilis. A simplified procedure is described which is not only efficient, but is easy of application.

Dr. Solomon C. Fuller, Pathologist, State Hospital, Westborough, Massachusetts. Proliferation of the Cellular

Neuroglia and of Mesoblastic Connective Fibers in the Paretic Cortex.

Dr. Richard Dewey, Wauwatosa, Wisconsin. Difficult Diagnosis in the Case of Paranoia.

Dr. Edward F. Leonard, 25 East Washington Street, Chicago. Report of a Case of Paranoia, with pictures and charts.

DISCUSSION

Dr. Goldwin W. Howland, 638 Spadina Avenue, Ontario, Canada. The Fundamental Cause of Epilepsy.

Dr. L. Vernon Briggs, 64 Beacon Street, Boston, Massachusetts. Bromides: Their Abuse, Especially in Epilepsy.

The temptation to prescribe bromides for sedative action, rather than to prescribe remedies for the cause of symptoms of disease, is unscientific. Bromides are toxic in action. Epilepsy is frequently a toxic disease. The use of bromides can, at the best, merely allay symptoms, and may produce others more serious than those for which it has been prescribed, and it may retard recovery.

Dr. Tom. B. Throckmorton, Des Moines, Iowa. Traumatic Epilepsy, Complicated After Fifteen Years by Traumatic Cerebral Hemorrhage. Operation. Apparent Recovery.

DISCUSSION

WEDNESDAY AFTERNOON PROGRAM, JULY 11TH, 2:30 TO 5:30 P. M.

Dr. Gordon S. Mundie, Associate in Neurology, Royal Victoria Hospital, Montreal, Canada. Some Types of Peripheral Nerve Lesions in Returned Soldiers. Illustrated with lantern slides.

Most of the lesions observed have been in the upper extremity, only two being situated in the leg. The nerve lesions are divided into: (1) Complete severance of the nerve; (2) partial division of the nerve; (3) pressure on the nerve by bone or cicatricial tissue; (4) loss of function of the nerve. Causes of lesions, examination of lesions, and the importance of electrical examination. Discussion of cases.

Captain J. Elliott Royer, 30 North Michigan Avenue, Chicago, Illinois. War Neuroses; Experience of Over One

Year in the British Neurological Service.

Dr. Herman N. Adler, 116 South Michigan Avenue, Chicago. Psychoses in the Mexican Mobilization of 1916.

Edgar King, Major Medical Corps, Fort Leavenworth, Kansas. Mental Diseases and Defects in Troops.

There will be other papers discussing different aspects of military psychosis originating in the army.

Dr. Arthur W. Rogers, Oconomowoc, Wisconsin. Head Trauma as an Etiological Factor in Insanity.

Increasing recognition of head trauma as an etiological factor in insanity. Traumatic insanity does not have a specific syndrome: more liable to develop on favorable psychopathic soil. Psychopathic symptoms apparently have little relation to the degree of injury. There is unquestionably a true pathology in these traumatic cases.

DISCUSSION

WEDNESDAY EVENING PROGRAM, JULY 11TH, 8:30 TO 10:30 P.M. Presiding Officer, Dr. Charles E. Humiston, President of the Chicago Medical Society.

JOINT MEETING OF ALIENISTS AND NEUROLOGISTS OF AMERICA WITH THE CHICAGO MEDICAL SOCIETY.

Dr. G. W. Brock, Atlanta, Illinois. Insanity in American Prisons and the Prison Psychosis.

The necessity of mental examinations in courts to prevent the sentence of insane criminals to prison. The percentage of criminals that become insane and receive special care as such, the facilities of the various states for such care. Classification and segregation of criminals based on mentality and criminal tendency. Relative frequency of the various psychoses, the prison psychosis. Should this term be dropped? The occasional case of frank insanity constitutes the least of the problem in dealing with abnormal mentality in prisons.

Dr. W. S. Lindsay, Topeka, Kansas. Legal Aspects of Insanity.

Differences of laws in various states regarding residence, commitment and care of the insane. Need of more clear understanding of what constitutes legal insanity. Suggestions to the "National Conference of Commissioners on Uniform State Laws."

Dr. Gershom H. Hill, Des Moines, Iowa. Natural and Legal Guardians Described and Compared.

Mr. A. L. Bowen, State Charities Commisson, Springfield, Illinois. Legal Shortcuts to Commitment.

Mr. Edwin R. Keedy, University of Pennsylvania Law School, Philadelphia, Pennsylvania. Insanity and Criminal Responsibility.

Dissatisfaction with the methods of trying the issue of insanity in criminal cases have been frequently expressed. The layman claims that defendants are escaping responsibility for their crime on the plea of insanity by reason of the venality of the medical experts, the strong and corrupt partisanship of counsel for the defense, and the incompetency of the judge and the prosecuting attorney. In proposing reforms the proper relation of the medical and legal professions is often overlooked. The proper solution of the question stated. A definite plan for the fulfillment of satisfactory results will be suggested.

Mr. W. O. Hart, Prison Reform Association, New Orleans, Louisiana. Insanity as a Defense to Crime in Louisiana.

First statute in Louisiana in regard to insanity as a defense to crime was passed in 1844.

Present jurisprudence in Louisiana is, that while insanity, when set up as a defense, must be proved by the defendant, it need not be proved beyond a reasonable doubt, but only by a fair preponderance of evidence. Temporary insanity produced by intoxication is of itself no defense. Where the accused, after conviction and sentence, is alleged to be insane, the court where he is convicted must pass on the question and not the court of the original conviction. Non-expert testimony is admissible to prove insanity, but this testimony is subject to limitations.

Dr. Paul Bower, Indiana State Prison, Michigan City, Indiana. Psychology of the Criminal Under Sentence of Death.

Dr. William J. Hickson, Municipal Court, Chicago, Illinois. Psychiatry and Sociology.

Mr. Charles B. Towns, 293 Central Park West, New York City. How to Eliminate the Alcoholic as an Insane Problem.

Dr. Frank P. Ely, Des Moines, Iowa. Pathological Lying.

Dr. Marc Ray Hughes, St. Louis, Missouri. The Curability of the Insane.

Dr. Meyer Solomon, 3530 Douglas Boulevard, Chicago, Illinois. The Importance of an Antecedent State of Uneasiness as the Cause of Pathological Types of Conduct.

Dr. S. Grover Burnett, Kansas City, Missouri. A Clinical Report of a Third and Fourth Case of Dual Personality.

DISCUSSION

THURSDAY MORNING PROGRAM, JULY 12TH, 8:30 A. M. TO 12:30 P. M.

Dr Adolph Meyer, Johns Hopkins Hospital, Baltimore, Maryland. A Program of Investigation of Dementia Precox.

Dr. H. Campbell Stevens, 25 East Washington Street, Chicago. The Salient Mental Defects in Dementia Precox.

By means of the Rossolimo test it is possible to determine accurately the strengths and weaknesses of the chief mental traits of an individual. Attention, suggestibility, perception, memory, imagination and reasoning are some of the mental traits tested by Rossolimo. The application of these tests to a series of dementia precox cases shows that the chief mental defects are increased suggestibility, the lack of constructiveness and diminished power of observation and reasoning. Explanation of a ease with which early cases of dementia precox fall into wayward and criminal modes of behavior.

Dr. H. J. Gahagen, Elgin, Illinois. Methods for the Reawakening in Cases of Dementia Precox.

A class of nine stupid, retarded, careless and untidy women suffering from dementia precox were placed under the special care of a woman nurse. An account of her successful efforts. The future care of dementia precox patients in state institutions involves personal attention to each individual case, with the idea of preventing deterioration. Methods for successfully accomplishing this work.

Dr. Julius Retinger, Biochemist, Psychopathic Hospital, Chicago. The Abderhalden Reaction in the Diagnosis of Local Changes in the Brain and Other Organs.

Dr. Harry Jones, Bacteriologist, Psychopathic Hospital, Chicago. Some Laboratory Notes.

Dr. Bayard Holmes, 30 North Michigan Avenue, Chicago. Researches on Dementia Precox.

Dr. G. Wilsie Robinson, Kansas City, Missouri. Therapeutic Value of Lumbar Puncture in the Treatment of Catatonic Stupor.

Dr. J. B. Rogers, Independence, Iowa. The Value of Complete Blood Counts in the Diagnosis of Nervous and Mental Diseases. Observations Based on the Study of More Than One Thousand Patients.

DISCUSSION

THURSDAY AFTERNOON PROGRAM, JULY 12TH, 2:30 TO 5:30 P. M.

Presiding Officer, Miss Miriam E. Carey, Supervisor of Institution Libraries, Minnesota State Board of Control, St. Paul, Minnesota.

Miss Edith Kathleen Jones, McLean Hospital, Waverly, Massachusetts. Hospital Library Economics.

Reprints of this paper will be distributed at the meeting.

Miss Grace Shellenberger, State Board of Control, Des Moines, Iowa. An Experiment in Story Telling.

The two-fold purpose of an experiment in story telling tried in the hospitals for the insane was (1) to give pleasure to the patients, and (2) to arouse, through stories, an interest in books among the more lethargic patients. The spoken word has more power and vitality than the printed page. Materials selected, the preferences of the patients. Problems of grouping the audience. How to begin the experiment. Holding the attention.

Miss Florence Rising Curtis, University of Illinois Library School. The Insane Hospital Library and Its Problems of Administration.

The place of the library in the institution. Libraries for the patients, the employes and the medical staff. Problems of administration. The book collection and the book fund. The library room and equipment. The library service. State supervision of institution libraries. The future development of the hospital library.

Miss Nellie Williams, Lincoln, Nebraska. The Library from the Patients' Point of View.

The hospital library has been proven, by the patients' own testimony, to furnish a preferred diversion; to add variety to the other resources of creating interest; to relieve the monotony of enforced leisure; to recall former desirable associations and to provide new friendships. It helps to supply a little wholesome fun and add mental stimulus. A library being provided, the patient desires books exchanged frequently; enjoys regular visits to the reading room, and finds pleasure in listening to the reading aloud.

Discussion

Dr. George Donohoe, Cherokee State Hospital, Cherokee, Iowa. A Preliminary Report of Kindergarten Methods With Dements.

Dr. Herbert J. Hall, Marblehead, Massachusetts. Productive Occupations in Charitable Institutions. The Need of an Intelligent and Comprehensive Plan of Procedure.

Well chosen and well regulated work has become an important therapeutic agent, recognized everywhere. My purpose is to call attention to the wisdom of purposeful and economically justified occupation among patients who would otherwise be wholly or nearly unproductive. The recommendation of a committee whose business would be to study the field of invalid occupation, the principles involved, and make these principles immediately available.

Dr. Isabella M. Davenport, 1248 Wilson Avenue, Chicago, Illinois. Garden Work for Women in Public Institutions.

A brief review of the attitude of the profession and institutions in general toward the care and treatment of the insane (1893–1898). The benefit as a reward and as something to strive for of the convalescents' cottage; the tendency of the convalescent or chronic patient to rebel at much of the employment provided. Recital of an experiment in garden work with forty women patients. Results of this experiment.

Miss E. Elnora Thomson, Hull House, Chicago, Illinois. State Hospital Social Service.

In no other type of illness is the social history so necessary. Community benefits as social histories are given considerable weight in any work looking into the causes of mental diseases and methods for prevention. Social work should be part of State Hospitals. Ideal plan would be to work through a central group in a State Psychopathic Hospital, with local groups for each hospital, and a system for clearing cases and histories through the general office.

Dr. Thomas W. Salmon, 50 Union Square, New York City. What are Practical Tests in Mental Hygiene?

Mrs. Eleanor C. Slagel, Hull House, Chicago, Illinois. The National Society for the Promotion of Occupational Therapy.

The need of such an organization, some of the aims and ideals; recognition of the inspiration that comes from contact with other workers and formulating plans for the advancement of occupational work to meet existing conditions. The desire to meet intelligently the national problem of re-education. DISCUSSION

THURSDAY EVENING PROGRAM, JULY 12TH, 8:30 TO 10 P. M.
Illustrated with Lantern Slides.

Dr. Theophil Klingman, Ann Arbor, Michigan. Histological Studies of Multiple Sclerosis.

Dr. Peter Bassoe, 30 North Michigan Avenue, Chicago. The Mental Symptoms of Multiple Sclerosis.

Dr. John Nuzum, Pathologist, Cook County Hospital, Chicago, Illinois. Experimental Studies of Poliomyelitis.

Dr. S. V. Willhite, South Dakota State Hospital, Yankton, South Dakota. Building Their Own Homes.

Methods of construction, general description of buildings. Cost of construction and sources of saving. Benefits derived by both patients and institution. Savings to the state. Better buildings. Amount of work done.

REVIEWS, BOOK NOTICES, REPRINTS, ETC.

Diagnostic Symptoms in Nervous Diseases.—Second Edition, Revised. By Edward L. Hunt, M. D., Assistant Professor of Clinical Neurology, College of Physicians and Surgeons, New York City, 12 mo. of 292 pages, illustrated. Philadelphia and London: W. B. Saunders Company, 1917. Cloth, $2.00 net. A well written and well illustrated book. Concise and to the point. Especially interesting are the chapters on Gait and Reflexes.

Systemic Oidiomycosis: With Manifestations in Central Nervous System.—Fy Frederic J. Farnell, M.D., Providence, R. I., and Samuel Starr, M.D., Providence, R. I. (From the Pathological Laboratory of Butler Hospital, Providence, R. I.)

An interesting brochure from a surgical and neurological standpoint.

Mental Adjustments.—By Frederick Lyman Wells.

A thoughtfully and scientifically written book on psychology with considerable valuable psychiatry to the student as well as to the savant in neurology. The volume is one of the "Conduct of Mind Series." Edited by Joseph Jastrow of the University of Wisconsin. D. Appleton & Co., Publishers, 12 mo. Cloth $2.50.

A Journey Around the World, by an Oculist.—Dr. Flavel B. Tiffany, Kansas City, Mo., contemplates publishing in book form a description of his journey around the world, which will embrace his impressions of what he saw, not only in the various things that would interest the layman, but the professional man. This trip embraces visits to the eye clinics of London, Paris, Munich, Vienna, Buda-Pesth, Athens, Cairo, Palestine, Bombay, Calcutta, Colombo, Singapore, China, Japan, the Philippines, etc. The book will contain about 400 pages, 5x7 inches and to contain about 100 illustrations. Price, $2.00. Address all communications to the Franklin Hudson Publishing Co., 22d and Gillham Road, Kansas City, Mo.

THE BATTLE OF THE SOMME.—By John Buchan, author of "Green Mantle," "Nelon's History of the War," etc., etc. Jno. H. Doran & Co. publishers, New York.

An interesting and well illustrated volume of 264 pages.

The Alienist and Neurologist

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THE PSYCHOLOGY AND FORENSIC CONSIDERATI OF EXHIBITIONISM.

By

CHARLOT STRASSER, M. D., Zürich, Switzerland.

IF WE wish to accept the point of view that all human are amenable to definite laws, then certain phenomena of life would outwardly appear as detrimental to society and liable to prosecution. Are these by punishment either atoned for, or remedied and secured for the protecti society. Are our laws fallacious? In short, are we c with actual criminals and actual crimes, or are the malef no criminals at all but merely ill, abnormal people acti voluntarily against their better understanding and consc And with this question of *responsibility* the psychology criminal begins. This also applies to the "normal malefa if we may speak of such, before and after the deed, consc or unconsciously.

There are crimes for which the mentally weak perpetrator can never b responsible for the compensation of justice just as there are crimes which, acc to our present day laws, are to be regarded as ethical and sociological beca the presumption that the delictions were committed by mentally sound indiv Between these two extremes we find, as everywhere in life, all stages and d Borderline cases are those which lead us to a changing relationship, by indi psychologic consideration and examination, in the development of the personal the perperator, and force the fact upon us that there is a contradiction betwe psychical and physical personality, between his existing moral conceptions and f and his unlawful conduct. All this tends to render any opinion on the quest responsibility very difficult. Such a malefactor awakens in us a doubt (mostl conscious) as to whether, from a purely humanitarian point of view, he should b responsible for his conduct.

Borderline cases showing a mental over-powering emotion, a suggestion—as in cumulative collective action*—as well as compulsive and impulsive morbid states, and apparent splitting of personality in a transitory double existence, often have the appearance of *subjective purposefulness.*** We can here recall to mind cases reaching into the realm of psychopathology—cases of hysteria, of double life, of kleptomania and pyromania, of perversions even to actual sexual crimes, and finally, emotional crimes and crimes of passion.

The question pertains also as to whether the responsibility arises from society, from the ethical and sociological laws already referred to, forming the foundation of our administration of law. *The conception and feeling of responsibility serves Man as a defensive weapon towards his own security.* Those who do not possess this feeling of responsibility, permanently or temporarily, as in the borderline cases, give the appearance of lacking the capacity of self-determination or of understanding the guiltiness of the deed; for in the *loss of responsibility* we find the appearance of a certain tendency which puts us in mind of purposefulness to which attention has principally been called by Alfred Adler† in his studies on character in neurotics.

Without inflicting severe injustice it may be said that homosexualists, pyromaniacs, kleptomaniacs, fetishists, sadists, masochists, exhibitionists, etc., have been regarded as having their disease inborn. Similar symptoms do not give in common the same picture of the disease but all their characters taken together and pursued individually are similar.

The three cases of exhibitionism that I wish to describe here are sharply circumscribed for the consideration of the question as to whether at the time of the commission of the deed they had the power of judgment, the capacity of self-determination and an appreciation of the guiltiness of the action.

As it is the case with the born criminal in criminal psychology, so it is with the born pervert—the question of curability conflicts with the penal law. It is self-evident that exhibitionism as a *habit*, as an *automatism* can be broken and it is still further evident that such sickly individuals belong, *not in prison*, but under the treatment of a specialist. The question is important enough for the practical consideration of jurists and legislators. Only the therapeutist or the jurist who has a deep, intelligent insight into the life and affliction of his patient or delinquent, especially as concerns neurotics, is able to grasp the clinical picture of the crime and thus aid in the treatment or in the reformation of the individual. The past, present and future of the clinical picture of the disease or of the clinical picture of the crime must be borne in mind, for it all depends upon the individual himself, upon his own possibilities and efforts, perhaps with more or less extraneous methods of consideration and correction, to vanquish or to learn to subordinate his ideal of personality as much as possible.

From the above propositions regarding the curability and the capacity of change of character, in which I regard as indispensable for its proper opinion and consideration the development of the character-picture, I wish to refer to the formula by which I am guided in my opinions on exhibitionism.

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*Charlot Strasser: *Das Kumulativverbrechen. Ein Beitrag zur Psychologie der Kollektivverbrechen. Grossches Archiv für Kriminalistik Kriminalanthropodigie.* 1912.

**Strasser und Eppelbaum: *Zur Psychologie des Alkoholismus*, 1912.

†Alfred Adler: *Ueber den nervösen Charakter*, 1912.

In exhibitionists, whose character shows also further nervous symptoms, the direction of the sexual impulse is abnormal, which may be traced back to childhood. At such an early period the sexual emotions are peculiarly influenced by outside conditions and are incorporated in the formation of character in a so-to-speak unconsciously lying life's goal. Frequently this is compensatory to a sense of insufficiency. The still unintelligible sexual emotions become established in a definite way unconsciously (in a psychological sense) and then develop automatically, always stronger in the direction assumed from the start so that is seems as if the feeling, the affection becomes so powerful as to be beyond the influence of better judgment, of better moral and social knowledge. According to this mechanism, not only exhibitionism but all other sexual perversions and perversities originate. We are here by no means dealing with a moral destruction and want of sensibility but with a morbid symptom, a psyche, perhaps originally implanted in the organic and spiritual constitution developed under special conditions and under the action of special events.

Sexual perverts, such as exhibitionists, are taken unawares by their feelings so that the impulses which enable the normal person to master his feelings do not occur. After the deed, when the general condition of excitation has passed over, it would seem as if the patients realize the social nature of their relations; they feel ashamed, they are tortured by self-reproach, they live in constant fear of punishment and imprisonment and if they be so punished and placed, in a way, on the same basis as ordinary criminals, they can be harmed eventually for the rest of their lives.

The homosexualist is always known to be rancorous against his actions and their punishability. At the time of the commission of the act, at the moment of its commission, his recollection, his understanding is restricted and the *punishability of the act* produces no influence upon him. The *capacity of self-determination* at the moment of the commission of the deliction is, however, certainly elevated, for the exhibitionist is acting under an instinctive, psychic compulsive condition.

The question now arises, if *measures of surety*, of a medical nature, are to be recommended for the exhibitionist inasmuch as he may cause social scandal and harm which cannot be concealed. The statements of exhibitionists, which all seem to agree, point out that many of their excitations are heightened by the smiles of pursued and molested women.

Such perversions, such as exhibitionism in the foregoing form, which lie in the individual's character are by all means curable and can be overcome by medical treatment. That punishment as a means of deterrent and training exerts but very slight influence is shown by the relapses of punished exhibitionists who, in spite of their self-reproach and torture of soul, fall back into the usual detestable habit. A renewed punishment would affect and endanger the whole existence and normal relations (occupation, marriage, etc.) of the patient, which have an ethical restorative influence, if indeed it would not destroy them entirely.

In order to meet the reproach that such a humane view of exhibitionists may serve as an assistance to such perverts it is to be remarked that a previous history and development are necessary which could trace back the origin of the patient's exhibitionistic actions. If the cure of such psychic mechanism be provided it is, of course, self-understood and necessary that we have certain guarantees that the patient will attend to the treatment. The proposition could then be made, which could serve as a condition, that the patient place himself entirely in the hands of the specialist whose treatment he is going to take until the completion of same, that is, until the time when the physician believes that a cure has been accomplished or at least until the physician regards him as no longer dangerous socially. Proof of the course and results of the treatment should, of course, be demanded. The patient could further be warned that in the event that he does not obey and carry out the treatment it would be compulsory to place him in an institution for observation and treatment. Thus a certain training could be won for such patients which would be of especial value for minors and the uncorrupted and it would teach and develop within them a sense of responsibility toward themselves and toward others.

In this respect it may be added that exhibitionists (with, of course, for each case individual psychologic methods of examination and consideration) whose character also shows unquestionable neurotic symptoms and the capacity of self-determination and who understand the guilt of the deed, seem not to possess, at the time of the commission of the deed, the power of judgment as to the punishability of the deed.

I wish here to refer to three cases and consider them in short together with some practical, important psychologic remarks.

Case I.

The mother and maternal grandmother of the 25-year-old patient were nervous characters, otherwise his heredity is not affected. In his childhood the patient was *weakly* and suffered from stomach and intestinal troubles. His first recollections of childhood: "I used to be dressed by my mother or by the servant girl and always felt apprehensive." *As far back as the patient could remember, the patient was exceptionally bashful.* He showed a feeling of bashfulness from childhood on particularly before women. His mother and grandmother used to tell him horrible stories taken from the newspapers which made him all the more timid. He used to feel a setback by his brothers and sisters as well as by his father and very strict mother, and at an early age had already begun to feel this bitterly.

Probably because he was treated so strictly and severely he was so timid that he was afraid to look anybody in the face. Because also of the puritanical spirit in the family he felt depreciated in the presence of his school comrades whom he envied.

When he was seven years of age he had some trouble with his bladder. Until he was ten years of age he suffered from *bed-wetting.* The reproach and punishment that he received therefor made him feel bitter injustice. When he was eight years old he met with some kind of accident about which he has not much recollection except that he was stiff and his face was drawn and he fell down. When he was thirteen years old he rescued a girl from drowning at the risk of his own life.

In school the patient for the first time heard about sexual things although until the present day he was not correctly informed on these matters. It was *strictly forbidden* by the teacher, during the entire secondary school period, *to speak to a girl or to go with a girl.* But just because of this prohibition he and his school-fellows would indulge in phantasies especially on sexual matters.

As an apprentice he had a little love affair with a seamstress; she used to pass the place where he worked but he never had the courage to address her. But on her birthday he took the privilege to send her congratulations on a post-card. Following this they used to correspond, quite in secret, not extensively, but a card now and then. The patient finally accompanied her to a village holiday where they passed the time in a very friendly way.

At about this time he began to have nocturnal pollutions which frightened him a great deal inasmuch as he thought he was sick. In his dreams of pollution at this time he never had the sensation of executing the sexual act himself, but in his dream he always witnessed the sexual relations of a third party.

Then he came to the large city as an assiduous and saving office-holder. For a long time he shared his room with a friend from which they removed because a neighboring female roomer, a prostitute, began to make advances to these two bashful youths in such an obtrusive way that they found it most embarrassing.

The patient began to *gain in weight* considerably for the reduction of which he would undertake long tours and mountain climbing. Once he fell and suffered a great fright. On another occasion when he undertook a more extensive tour he and his companion lost their way and they spent many anxious hours in danger from thunderstorms and avalanches. After this occurrence, he experienced many exciting dreams in which his anxiety and danger came vividly before him.

The patient was also a good and happy soldier. He never had any sexual relations with a woman and never went around with prostitutes. During his service at his post he made very few acquaintances among women. Morever his ethical views and his bringing up did not allow him to enter into conversation with a woman without an earnest purpose.

When he was 19 years old some obscene pictures were shown him with which he was very irritated without, however, being able to forget about them. Finally the time came when he began to practice onanism. Excerpts from various books caused him great torture, but in spite of this he could not become master over his habit. He would become excited when he saw a beautiful woman or pictures of women.

Two years ago the patient noticed that during his masturbation he was stimulated if he could observe a woman from the window. Later on he found it favorable to imagine sexual intercourse with the particular woman and finally he got the idea that the only possible way for him to become stimulated would be to have the woman witness his sexual act. He was also, on several occasions, able to see the woman (whom he always had in mind) undress herself.

Later on he discovered that his tendencies were not confined to the one woman, but that other women produced the same effect upon him and about one year ago he became possessed with the notion that his greatest satisfaction would be to have a woman witness his masturbation. This obsession became so strong that he tried to separate the curtains behind which, heretofore, he always secreted himself. For a long time he did not trust himself to do this, but after it was once done he experienced a great deal of remorse. For quite an entire year he thought that he had not been seen, but finally he believed that he had been observed, and the woman in the next room, it appeared to him, made similar motions. After that he was less careful, bolder, audacious and practiced his sexual act until the orgasm, sitting in front of his window in the morning or after working hours. The frequency of this practice increased.

He tried his best to overcome his habit and especially from exhibiting himself in his window, without avail. He reproached himself time and again and suffered great anxiety because of his abnormality and would ask himself the question if there were other people afflicted with the same propensity as he. He was always moderate in the use of alcohol.

Case II.

The 24-year-old patient is affected badly. His father was a drinker. Two of his sisters are epileptic and one sister was, in time, committed to the insane asylum. The patient has *compensated heart lesion*, as a result of which he was exempt from military duty. Because of this heart lesion various restrictions were placed upon him even in his childhood. He suffered frequently from palpitation of the heart.

By his father he was treated too roughly and by his mother in just the other extreme—too kindly. As far back to his earliest childhood as he could recollect he was *exceedingly bashful*, even before his own mother.

When the patient was seven years of age his father died and he was committed to an orphan asylum. Strict discipline and lonesomeness for home caused him in the beginning to run away. From the time of his entrance to the orphan home he suffered from *nocturnal enuresis*, for which he was repeatedly severely punished. Until his thirteenth year he and his comrades, 16-18-year-old girls, were bathed weekly. The patient always regarded this as a painful ordeal. In fact, they complained to the superintendent of the orphan asylum, but they were laughed at.

At an early age the patient heard about sexual matters. The boys and girls of the home would carry on their conversations in secret on these things. During the work in the garden the boys would look underneath the girls' clothes. An eleven-year-old girl would place herself in such a position—she wore no underclothes—that the patient could not help but see her sexual organs. When the patient was 14 years old the boys would compare the size of their sexual organs with one another. He also observed the superintendent having sexual relations with one of the orphan girls.

With two class-fellows, a girl and a boy, the patient would have immoral relations. The boy, who was a South American, used to play in an obscene way with the girl until finally he exhibited himself before her. The patient remained fully passive; nevertheless this, as well as all the previous immoralities, worked upon his imagination for a long time. During his whole youth the patient was very timid and awkward and especially in relation to the female genitalia. Towards his school-fellows in the city school, some of whom were also from the orphan home, he felt very backward especially so because he knew about them in the home.

Against his desire the superintendent of the orphan home apprenticed him to a barber. While an apprentice he began to masturbate and read various publications on sexual matters (especially a book on "Neurasthenia," by a certain Dr. Rumler, which has given anxiety to a good many of my patients and was the cause of the aggravation of their condition). In time the patient would at the time of masturbation, keep a mental picture before him either of some woman or of the female genitalia.

The first sexual connection that he had was in a brothel under circumstances which he cannot forget and as a result of which he carried away a fearful abhorrence of women. A second normal sexual connection was afforded him by a milliner, years later, whom the patient loved earnestly. She jilted him, however, and a friend was only able with difficulty to restrain him from committing suicide. Otherwise before women he was constrained and bashful.

Four and one-half years ago he was watching 16-18-year-old girls sledding. Under an unexplainable, sudden impulse, without seeing or hearing of anything similar from anyone else, he opened his trousers and exposed his penis. That the older of the girls laughed at his action tended to excite him.

Subsequently, after he had repeated his attempt on three occasions he was arrested and sentenced to ten days' imprisonment. He suffered greatly from the disgrace and for two years he was able to restrain his impulse. Then he began to frequent various summering places. His apprehension of the danger in large cities began to diminish. He continued to exhibit himself, with full realization that he was doing something wrong, but unable to restrain himself. In Paris some girls who seemed to enjoy his exhibition, called to him to accompany them, but he was afraid of venereal diseases on the one hand and he had an abhorrence of the girls on the other hand; he would go to his room and masturbate.

A year and one-half ago the patient fell in love with a simple country girl (who, it so happened, was also in my care) and for whom the patient, in every way possible, held the highest respect. He never allowed himself to talk to her about sexual matters—it was, of course, out of the question for him to have any sexual relations with her. Nevertheless shortly after the engagement he began to exhibit himself anew from time to time. He had a list of girls before whom he made it a practice to exhibit himself in public places or on the main street. He would walk about with his penis concealed under his cloak and when he met one of these girls he would throw aside his cloak and expose himself for a second.

Case III.

The father of the 24-year-old patient was a drunkard. A brother suffers from pulmonary disease. The patient himself also has always had some trouble with his lungs, has been sickly and weak since childhood, suffering often from whooping cough and headaches. When he was 20 years old he got an inflammatory heart lesion from which he was exempt from military duty. He frequently suffered from intestinal catarrh.

As a child he was bashful, anxious and timid and even today he perspires from fear if he has to pass all alone through a dark forest. He is nervous and given to anger. The patient recalls that when he was 4 or 5 years old he was *exceedingly bashful* and had to be threatened with punishment by his mother in order that he submit to being undressed in the presence of his brothers and sisters for the purpose of being bathed.

The family conditions, for the father had died early, were very unfortunate. An older brother used to strike his brothers and sisters in a brutal way. The patient always felt as if he were neglected, particularly so as it was afterwards told him that he was unbaptized for three years for the reason that no time could be found for his baptism.

When he was eleven years old he was placed in a Pestalozzi home. In this institution a good deal was spoken about sexual matters. The boys used to compare their sexual organs with one another. As the patient was one of the smallest and weakest of the lot he always felt very grieved that he had been insufficiently developed. His sexual organs were smaller than those of any of the other boys and for this reason they would make fun of him, especially when they were all bathing. The boys bored a hole in the partition separating the girls' division and would invite the patient to peep through. For this he became sexually excited and began to masturbate. But this alone did not satisfy him. He would therefore go into the washroom, find a pair of girls' drawers and masturbate on them. He found that he would be exceedingly excited when he, at the time of masturbation, could keep a mental picture before him of a naked girl.

The patient, who was an apt scholar, became an apprentice in a printing establishment as a typesetter. Just as he at first, as a boy, found it necessary to have a mental picture before him of a naked girl at the time of masturbation, he now was obsessed with the idea that he had to excite the woman by exposing himself before her. Once in his boyhood while urinating under a tree a woman happened to pass by. He now thought of this and while masturbating imagined the excitation of this woman. Then he started to wander about exhibiting himself in the hope that some woman would pass by and observe him.

He never had the courage to accost a woman directly because of his fear—especially syphilophobia—of contagious diseases. In regard to his own practices he felt the greatest self-reproach. Then for a time he had normal sexual relations and did not exhibit himself. But finally he began to exhibit again, especially from his window where he could be seen. He was seen and complaint to the authorities having been made, he was arrested and sentenced to imprisonment for two days.

A year later he married and apparently lived very happily with his wife. During her pregnancy he had coitus with her regularly. His economic situation was so unfavorable that after the birth of the child, a boy, he abstracted from normal coitus partly through fear of begetting a second child which would further impoverish him—he did not know what means to take against conception—and partly through timidity, so that he finally returned again to his former habits.

From the consideration of the life history of these three patients it would seem to be perfectly possible to draw a sharp line between the very distinctly conscious bashfulness, timidity and shyness of early youth, especially against women, on the one hand, and the evident, unheard-of audacity, boldness, obtrusive and reckless exhibition in later life, on the other hand. A line which, *in Case I*, seems to run parallel with the combination between the weakness and sickness of childhood and the forced bravado, the mountain-climbing manliness and contempt for danger, of later life. No links are absent in the development of the extreme points of the so-called "leading lines."

The "*organismic depreciation*," taken in the sense of Alfred Adler (the weakened foundation, the gastro-intestinal disease in *Case I,* the heart lesion in *Case II*, the lung and heart weakness in *Case III*) is common to all three cases. All three patients were, in their recollections of early childhood, exceptionally bashful, especially in regard to the female genital organs; they were timid, shy, and felt depreciated and unjustly treated by their comrades. They felt that they were not as good as the rest; they could not partake of everything, they could not have everything.

At a certain age patients I and II suffered from nocturnal enuresis. In patient II this nervous symptom appeared as a result of the unjust and hard treatment he received from the superintendent of the orphan asylum. The "spiteful, defiant attitude" cannot be distinctly expressed.

Patient I recalls and blames the development of his sexual sensitiveness particularly upon the teacher's injunction *never to have anything to do with a girl.* Because of this very prohibition he and his comrades had "phantasies" all the more intensive on matters pertaining to sex. Patients II and III have recollections, to use Freud's expression, of "*sexual traumata.*" Patient II remembers a girl's exhibition of her sexual organs before him; he also compared his own genital organs with those of his comrades; a school-fellow in his presence exhibited himself before a girl who also had a certain sexual nimbus; his witnessing of the superintendent's immoral relations with one of the orphan girls stimulated "phantasies" in his mind. Patient III recalls the exposure of his sexual organs before his comrades and the shame he experienced when he was looked upon by them as of inferior development, as he was not treated as well as they were; he watched naked girls while they were bathing; for a time he was a real fetishist masturbating with the mental picture of a naked girl before him. All three patients use the same expressions in their narrations of their life histories. One felt the injunction of the teacher; the others the forbidden acts of his comrades, male and female, and the breeding of the "phantasies."

Our patients then entered upon outside life. They were brought up honestly and all three were ambitious. Their conscientious ideal was to be brave and honest. They show a certain abstention from prostitutes and are ignorant and inexperienced in sexual matters. To a certain degree they hold the female genitals in depreciation, in repulsion. Even today they are afraid and awkward in relation to women. The bride of patient II takes up his inner life (this is also indicated in patient I), and he respects her so much that he could not permit himself to approach her except under the mantle of a civil or church marriage in order to make their sexual relations honorable. Patient III is a father, loves his wife and lives happily with her and to his honest and modest existence there come into contrast his punishable, shameful and immoral practices.

Patients I and III narrate very clearly the various *phases of their conversion* from weak, shy, bashful individuals to bold, manly exhibitionists. Patient I could not bear to be looked at when he was a child, whereas during his school years he himself looked at others eagerly; he was shown obscene pictures which repelled him, still he always thought about them and found it necessary to retain them before him as mental pictures in order to satisfy himself.

The anxiety which raised his courage to manly sports became extended to boldness against women. Here he scents danger and tries to evade it (patients II and III show the same complex but with them the fear is due to hygienic conditions—they are afraid of venereal diseases). He desires the women just because he does not dare approach them. He wishes to subordinate himself just because he thinks that he could thus make concrete his symbolic longing for manliness in a sexual character. Just as soon as he has attained this he follows this fiction, in order to see sexually the symbolic result of his manliness, because he is able to provide an equal sexual victory in his "phantasie."

During his act of masturbation he imagines before him women whom he has met but whom he dared not approach; or he imagines pictures which he dared not possess. *He tries to make his imagination a reality.* He is a neurotic (essentially I regard the symptom of exhibitionism as connected with a nervous character). *He tries to believe that his own sexual excitation is shared by the woman of his imagination.*

He has become so accustomed to this that he has fallen into a state of *automatism* and although he is still able to distinguish the contradiction between fiction and reality, and express it, he is not in a condition to give a just account of his action except that it results from a once implanted tendency. Through symbolic courage and boldness towards women he becomes overwhelmed even to the extent of *committing a criminal action.*

I wish to compare *sexual passion,* to the support of which there is developed a *symbolic instinctive action,* with impulsive action. Here the patient sees nothing before him but the deed, the object to be attained, which in its last analysis signifies the effort to conquer his unmanly, effeminate shamefulness, and at this instant he is unable to perceive what is proper. There is present what I call *subjective purposefulness,* for the objective impropriety of the patient's act, without this impulsiveness, without this sexual passion, casts off responsibility and restricts his comprehension.

If we bear in mind and follow the ways and means of the development and application of this passion for the support of the subjective purposeful tendency, for the support of the unconscious "plan of life" we find that it may lead to acts in Society which may be construed as against social welfare and of general danger. The development of other characteristics may also occur, such as anger, jealousy, revenge, etc., leading directly to very serious offenses that are purely *crimes of passion.* These surpass the crimes of passion which, according to modern criminal psychology, contain either consciously or subconsciously, a *sense of responsibility* and a *comprehension of the nature and punishability of the deliction.*

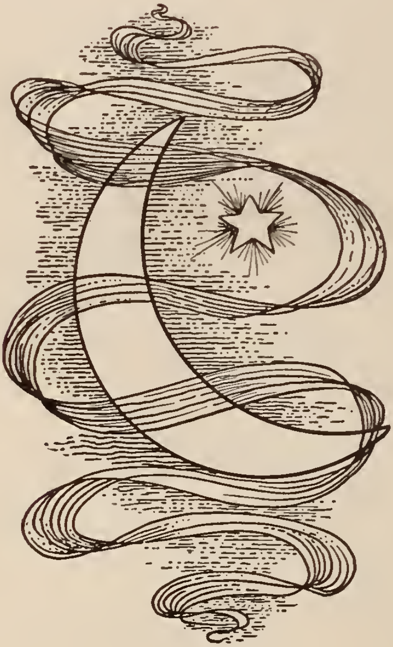
In case II and case III, I believe the development to be quite analogous. There seems to be an opposition between the action and the desire, as in case I, for apparently a similar purpose: *for the compensation of their unmanly sense of shame by means of sexual boldness.* They grasped at events of their youth out of the past. Patient II was able to trace his development by seeing an exposure downward before finally exposing himself—to actual occurrences in his childhood. A girl exhibited herself before him. A school-fellow exhibited himself before a girl in his presence. His first normal sexual relation was repulsive to him.

Patient III recalls that his comrades regarded his sexual organs as weaker, and more effeminate than theirs and he felt depreciated. Both patients towards women felt themselves of lesser value, depreciated, and oppressed. Patient III dared, in fact, to reveal his sexual tendencies to his wife and shrank from sexual relations out of fear of increasing his family—in the same way as he previously shunned sexual intercourse because of his fear of syphilis.

Without knowing why or how, both these patients forced themselves to exhibition. But the psychological reason for it was that they wanted to depreciate the woman and elevate themselves above their own weakness and timidity by boldness in subjective purposefulness.

Looking back over what has been said on these cases we involuntarily, and, therefore, more convincingly perceive the truth of Adler's neurosis—and character-teachings. The constitutional, organic and spiritual mode of life is built in advance. The weak habitus of the three patients is quite presumptive; the further development, surrounded with the various events, takes place in a definitely determined constitutional direction and we meet it everywhere in this way.

"*Der ununterbrochene Anreiz zur Zielstrebigkeit ist beim Menschen durch Gefühle der Insuffizienz gegeben. Was wir Triebe nennen, ist schon der Weg und erweist sich als durch das Ziel orientirt. Die Fähigkeit des Wollens sammelt sich trotz scheinbaren Widersprüchen, um zu diesem einheitlichen Ziele durchzudringen.*" (The uninterrupted impulse to strive towards an aim is given to Man through the feeling of insufficiency. What we call inclination is the path and it seems as if orientated by the aim. The capacity of the Will accumulates in spite of apparent contradictions in order to penetrate to this single aim.)



THE FUNCTIONAL NERVOUS DISTURBANCES OF QUATERNARY HEREDITARY SYPHILIS.

By

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BEFORE commencing the study of the nervous derangements which can supervene in quaternary Hereditary Syphilis I believe it would be of use to briefly review the classification proposed by me for the different manifestations of Hereditary Syphilis, a classification which appears to me more rational than the division into *precocious* and *tardy* Hereditary Syphilis—which is very insufficient.

A—I call *secondary* Hereditary Syphilis the *parasitic* and *generalized* infection which corresponds in all respects to the secondary period of acquired Syphilis; it is always precocious.

B—Tertiary Hereditary Syphilis corresponds to the tertiary period of acquired Syphilis, and as is true for the latter, it concerns a *parasitic, localized, attenuated* infection, that is to say, an infection of an older virulence. It may be precocious or tardy.

C—I term *quaternary Hereditary* Syphilis that degree or kind of infection which corresponds to the Para-Syphilis of acquired Syphilis; here we are dealing with lesions that are of Syphiltic *origin*, but not of a syphilitic nature, which are not or but little influenced by specific treatment, and which, in the majority of cases, do not depend upon the action of the parasites themselves but their toxines, and testify to a distant heredity.

This quaternary Hereditary Syphilis may be precocious or tardy, exist from birth or make its appearance a long time afterwards.

D—Quinternary* Hereditary Syphilis comprises all the *congenital* malformations and dystrophies, consequently all the defects and arrests of development, upon which treatment, let it be well understood, has no action.

Quaternary Hereditary Syphilis, like all Syphilis and like secondary and tertiary Syphilis, with predilection attacks the nervous system, and in doing so it may here determine two sets of accidents:

(1) Disturbances due to nervous lesions with a well-known anatomical substratum.

(2) Functional, *dynamic* disturbances without lesions, at least none that are known.

Into the first group belong certain *Cerebral Scleroses, Infantile Spasmodic Tabes,*

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*While this word is readily understood, there is no authority for its use in English, where "quintan" would be better; it corresponds, however, so exactly to the French and explains itself so perfectly, that we may let it stand.—Translator.

Juvenile Tabes and General Paralysis, Hereditary Ataxy, and certain forms of *Infantile Paralysis* which form the object of this essay.

Under the second group I class the *convulsions of early infancy, the headache** (*cèphalèe*) *of growth, essential epilepsy, neurasthenia and hysteria, imbecility and the other disturbances of mental degeneracy, certain of the varieties of "tic," of stuttering,* and finally certain manifestations of *disturbances of cerebro-spinal equilibrium,* such as *nocturnal urinary incontinence,* all affections which we shall successively study.

All these nerve-troubles connected with Quaternary Hereditary Syphilis, have, moreover, one characteristic feature in common, and that is, that they do not improve under the influence of treatment, and it is for this reason that their syphilitic origin was not recognized for so long a time. Now-a-days this argument as to the non-efficacy of treatment has no longer any weight. Similarly, who would dare deny the importance of the syphilitic etiology in cerebral arteritis, under the pretext that treatment frequently remained without effect?

Infantile Convulsions.

The convulsions of early infancy, termed essential, that is to say, independent of cerebral and meningeal lesions, are very frequent in individuals afflicted with hereditary Syphilis.

I do not say that they might not possibly be produced by other causes than hereditary Syphilis, as, for instance, the gastro-intestinal affections; but without exaggerating the role of Syphilis as is done by certain physicians who specialize in children's diseases, still the fact remains that a great number of these convulsions depend upon hereditary Syphilis.

It is for this reason that the practitioner will always have to think of it, search for it and even, when in doubt and ignorance of his patient's antecedents, institute treatment. These convulsions, as a matter of fact, often yield to mercurial treatment, which, however, does not mean that there do not exist convulsions due to hereditary Syphilis which are cured without treatment or by a simple symptomatic treatment.

If an expectant conclusion be necessary, I will say that, most frequently, infantile eclampsia is dependent upon quaternary hereditary Syphilis, for we see these convulsions far more frequently in the descendants of Syphilitics than in other children.

Cephalalgia of Growth.

We are here dealing with an affection of adolescence.

I desire to speak of this *persistent* cephalalgia in young subjects which drives parents and physicians to desperation and which by them is attributed, turn about, to growth, to anemia or to intellectual over-exertion and which, happily, as a rule, goes on to a cure, sometimes even without treatment.

Professor Fournier had already referred to hereditary Syphilis these cephalalgias said to be due to fatigue or to development and which cause the young people afflicted by them to be treated as "shirkers" and who by these headaches are caused to turn from their work. They are given phosphates, iron-tonics, nothing touches the condition; mercury on the contrary, has been able to cure a certain number of cases. These are the headaches which, after having been appeased by simple repose, had reappeared and which had been definitely cured by mercurial treatment I would note here that the iodide of potassium, which is a congesting medicine, does not improve these cephalalgias, but acts quite to the contrary.

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*Cephalalgia.

Of course, it must be understood that we must differentiate them absolutely from the symptomatic cephalalgias of a tertiary cerebral affection with organic lesions.

These cephalalgias, therefore, are seen in the sons of syphilitics; it is, moreover, especially as family-physicians that we get to observe and follow these cases; here is an observation of such a case briefly summed up:

A young man nineteen years of age, whose father had come to consult me for tertiary syphilitic lesions, was preparing himself for the Polytechnic when he suffered from *cephalalgic headache* with nocturnal exacerbations which compelled him, on several occasions, to interrupt his studies. Knowing of his specific heredity, I instituted mercurial treatment; he was radically cured.

These cephalalgias may be derived from a syphilitic infection in the second generation, in case the grandparents are syphilitics.

Here is an observation of such a case due to Doctor Spillmann of Nancy,* which I will sum up as follows: The case concerns a young man afflicted with *persistent headaches;* his father and his mother are absolutely innocent of acquired Syphilis; but one of them is an hereditary syphilitic; and one of the grandparents had been treated for Syphilis. Mercurial treatment overcame this inherited syphilitic headache of the second generation.

Exceptionally, these cephalalgias may last a long time and may even persist in the adult. In testimony of this I cite the following case which I have observed: It was a man of thirty-three years of age who, for twelve years had suffered from *intense cephalalgia* with nocturnal exacerbations. He was myopic in one eye, one of his brothers also presented stigmata of hereditary Syphilis.

This cephalalgia was considerably ameliorated by mercury.

Essential Epilepsy.

It is now quite seven years that, in one of my lectures, I emphasized the very great frequency of these essential epilepsies of hereditary syphilitic origin. I am not speaking of that form of symptomatic epilepsy that depends upon a localized lesion of tertiary cerebral Syphilis. This partial, Jacksonian, epilepsy is classically distinguished from general epilepsy by the constant presence of the aura, the absence of complete loss of consciousness and of stertor after the crisis, and the frequency of consecutive paralysis. And, finally, there always exists, in these cases, a cerebral lesion. General epilepsy, on the contrary, is essential, that is to say it arises without lesion, at least without one that is definite and well-known; for I must add, that since we have studied these so-called essential epilepsies more carefully, we frequently find an underlying organic lesion as their basis, and the landmarks between Jacksonian epilepsy and general epilepsy are becoming more and more indefinite; this is the explanation of the fact that certain of these ordinary epilepsies which, in general, are incurable by mercurial treatment like the other nervous troubles of quaternary hereditary Syphilis, could be cured by mercury and consequently deserve to be grouped with the hereditary syphilitic affections.

Therefore, if it cannot be proven that all epileptics are descended from syphilitics, it is at least true that Syphilis is very often found among their antecedents. Professor Fournier was the first to remark this. The epileptics in whom we do not find hereditary neuroses are hereditary syphilitics, and moreover the Wassermann reaction in them is very often shown to be positive; and this is almost the confirmation of what, without having been demonstrated by this serum-reaction, has for a long time been considered probable.*

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*See Edmond Fournier: Diagnosis of Tardy Hereditary Syphilis.

Here again we find the possibility of heredity in the second generation.

From a clinical point of view we have seen that we are here dealing with common epilepsy with tonic, then clonic convulsions, starting up suddenly, offhand, or after an aura, with biting of the tongue, involuntary evacuations, followed by stertor and complete amnesia, corresponding to the absolute loss of consciousness which always accompanies these attacks.

Specific treatment should always be tried—to be abandoned, if it fails to give results, in favor of the bromide of potassium.

In support of the very great frequency of the hereditary syphilitic origin of these epilepsies, I have here a certain number of observations which I shall briefly present to you and which come from my hospital service or more often from my clientèle, where these cases of heredity can be better followed up.

1. A young lad, sixteen years of age, one day suddenly falls in the street, presenting all the symptoms of "*mal comitial*" (epileptiform convulsions). As the attacks renewed themselves the following days, he was brought to me; at this time he had had three heavy attacks during the day and abortive attacks at night which left their signature, the next day, in bruises upon the mastoid process. The child had no remembrance of his crises. The father, a diabetic, confessed to being syphilitic since his youth. Before this certainty of heredity I instituted specific treatment which gave absolutely no result.

2. A lad of twelve years, presenting convulsions since his infancy; eight brothers and sisters dead in early infancy. This polylethality should, by itself, cause one to suspect specific heredity, but an older sister of the little epileptic presented gummatous ulcerations of the two legs which healed in one month under mercurial treatment, and typical dystrophies, such as double genu valgum, a very highly arched palate, and multiple dental dystrophies.

3. A man, thirty-four years of age, whose mother had had two miscarriages before his birth presents crises of hystero-epilepsy since his eleventh year. His palate is highly arched. Moreover, for the past ten years, he has, on his legs, ulcerations which had been considered tuberculous and which, in fifteen days, were very much improved and almost healed with scar-tissue-formation by injections of benzoate of mercury and iodide of potassium.

4. The following observation, a very important one, concerns two sisters, aged, one thirteen years, and the other ten. Both are epileptics. The older has had *crises* since the age of eleven years, her forehead is bulging, "olympian;" her superior incisors present a notch upon their free border; she also presents intense strabismus of the right eye. (I have already shown how important converging strabismus is as a sign of hereditary Syphilis.) She did not walk until she was eighteen months old.

The younger of the two sisters had, one month after birth, a specific eruption of which typical cicatrices remain; she did not walk until she was twenty-eight months old; she was afflicted with double interstitial keratitis which was treated and cured by Gibert's syrup.** Her forehead is bulged, with a frontal hyperostosis on the right side; her teeth are of the Hutchinson's type; and, finally, she has a converging double strabismus, pupillary ectopia (the pupila turns upward and inward); her optic papilla (disc) is pale, depressed and also presents a pigmentary dystrophy of the choroid and retina. Her *epileptic crises* date from her first year; they are accompanied by loss of consciousness, loss of memory, and evacuation of urine.

Upon ophthalmoscopic examination one remarks a diffuse pigmentary dystrophy of the choroid and retina.

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*Ingehaus: Hereditary Syphilis of the Nervous System. *Gazette des Hopitaux*, 1904.

**Gibert's or Gilbert's Syrup (unofficial) consists of: Hydragyri Biniodidi, grs. iii; Potassii Iodidi, grs. cii; Water, ʒ iii; Syrup, g. s. ad ℥ x.—Translator.

5. A boy, aged eight years, is the last survivor of ten children, two of whom were miscarriages; all the others died at the age of four to five years of meningitis. The father is alcoholic and syphilitc; the young patient has already had the croup, typhoid fever, chicken-pox, and this shows us how vulnerable hereditary syphilitics are, and how easily accessible they are to the infectious diseases.

Since his second year he presents *typical epileptic crises*, accompanied by urinary emissions and tongue-biting, occurring every two or three months.

In the interval of these well-marked convulsive seizures he presents other, abortive, crises, as accidents of automatism.

As marks of hereditary syphilitic dystrophy there has been found in him only a crenulation of the free edge of the incisors which are the only teeth of the second dentition which have made their appearance in this eight-year-old child.

6. Next we have a young man nineteen years of age, *epileptic* since his fifth year, with typical seizures and presenting a certain number of defects due to hereditary Syphilis such as: bilateral converging strabismus, a high palatal arch, facial asymmetry, cicatrices of the labial commissures (at the angles of the mouth), and about the region of the buttocks, a remnant of a parenchymatous keratitis in both eyes, an abnormal smallness of the eyeball and ophthalmoscopic lesions, rudimentary albinism of the disc and diffuse pigmentary dystrophy of the choroid and retina, and in *whom the Wassermann reaction turned out to be negative.* It is, moreover, important to note that in all the hereditary syphilitic manifestations the serum reaction of Wassermann has no confirmatory diagnostic value except when it is positive; when negative it indicates nothing; the above case is a manifest proof of this.

7. Then we have the case of a man twenty-four years old, also an hereditary syphilitic, as is proven beyond a doubt by his bulging forehead with frontal protuberances, a marked loss of horizontal ocular balance (convergent strabismus) (a sign upon the importance of which Professor Fournier laid great stress), a high, steeply-arched palatal vault, and who, since the age of twenty, has been the prey of *seizures* of "*mal comitial.*"

8. A woman, thirty-five years of age, came to consult me about ocular lesions dating from infancy; her right eye is lost consequent upon an iritis and presents remnants of a parenchymatous keratitis, the same, moreover, as the left eye, the vision of which is better. In the presence of these damaging accidents due to Hereditary Syphilis, I instituted treatment by hypodermic injections of Benzoate of Mercury whereby the patient is much improved.

On questioning this woman I learnt that her father had died of general paralysis; that a sister, born before herself, had succumbed to *convulsions* at the age of three weeks, and that a younger brother who still lived is an *epileptic.*

Neurasthenia and Hysteria.

Neurasthenia, already quite frequent in acquired syphilis, as quaternary or para-syphilitic manifestations, making its appearance on a soil certainly prepared by a nervous heredity but where Syphilis plays a very important role since neuro-hysteria is much more frequent in syphilitics than in other patients, wherefore it is not a good sign to see a syphilitic become depressed,—is also seen in Hereditary Syphilis. In this case it arises precociously, at an age where one cannot invoke, as an explanation, either intellectual over-exertion, or nervous shocks. These are morose youths, incapable of effort and in whom asthenia may reach such a degree that they are driven to suicide (Professor Fournier).

Similarly, *Hysteria* is also seen in Hereditary Syphilis. I have seen two girls afflicted with this neurosis for which there was no other cause than their father's Syphilis.

I have had under my care an hysterical male who since his early youth presented *obesity*, and we know that precocious obesity is often a sign of quaternary hereditary Syphilis. The young brother of this patient was epileptic and presented testicular inguinal ectopia.

Still other diverse nervous disturbances are also seen in hereditary syphilitics; the principal ones among them are *the so-called night-terrors*, which I have noted twice; in the first case the patient presented multiple and undoubted dystrophies, ocular (strabismus) and dental; in the second, the father was an old syphilitic, dead from angina pectoris; besides, the *nervous excitations, the aberrations of the genital sense, imbecility*, at times with lapses of intelligence (I myself knew a patient who could not count), finally *degeneration* in all its degrees, running from complete mental derangement to such punishable acts as thefts and other crimes.

Many backward and degenerate individuals are, therefore, the descendants of syphilitics.

More frequently we have to deal with medullary *disturbances of the cerebro-spinal equilibrium*, such as tremors, uncertainty and awkwardness in many movements, and, above all things, *nocturnal urinary incontinence* of which I herewith submit several observations:

1. A young girl nineteen years of age, afflicted with *nocturnal urinary incontinence* since her early youth; her father was syphilitic, she herself presents converging strabismus, a highly-arched palatal vault, an asymmetrical skull, malformations of the lobe of the ear.
2. Boy of twelve, afflicted with *nocturnal urinary incontinence*, presents double convergent strabismus, a dolichocephalous, asymmetrical skull, malformations of the lobe of the ear, a highly-arched palatal vault, irregularly arranged and notched teeth, physical atrophy (he measures only 1 m-18 cm) and intellectual backwardness.
3. A man forty-one years old whose syphilis goes back sixteen years and who presents a periostosis of the left clavicle, comes to consult me with his child who has *nocturnal urinary incontinence*.
4. A man whose Syphilis goes back to 1891, also brings his child, aged ten years, to me; it is afflicted with *nocturnal urinary incontinence*, and its milk-teeth have not as yet all dropped out. Seen again, two years later, this child presented the characteristic divergence of its incisor-teeth which were, moreover, directed obliquely, slantingly in reference to each other.

Finally, I have also observed "*tics*" (twitchings) of the face and shoulder in verified cases of hereditary Syphilis, and I have observed an undoubted example of stuttering in a child whose father was syphilitic.

And without a doubt the list of nervous functional derangements due to quaternary hereditary Syphilis does not end here; there are perhaps others, and it is your duty, physicians, and especially family-physicians, to search them out by attentive observation, and some day to publish these observations, the fruit of your experience.

SOME ASPECTS IN THE MANAGEMENT AND THERAPY OF PSYCHIATRIC CASES.

By

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SOME apology is needed for bringing before you a subject outside of the domain of your usual practice. Nevertheless you will occasionally come across cases of the nature to be discussed here, namely, cases of mental derangements, and the question will then come up in what way they may best be dealt with.

On being confronted with such a case, two problems, among others, will mainly present themselves: first, the practical problem in the larger sense, what to do with the case, where to place it, how to manage and watch it, etc.; secondly, the more scientific problem of its therapeutics in the narrower sense.

It is not possible to do justice to a case without giving due attention to the practical problem first mentioned. Permit me, therefore, to discuss it first, especially since under such circumstances a practicing physician is confronted with concrete tasks which necessitate definite action. Not infrequently indeed the ultimate fate of a case depends largely on the measures taken at the beginning.

The question often arises, shall the patient be treated at home or placed in an institution? A state institution or a private one? Furthermore, if one has decided in favor of an institution, shall he enter the same as a voluntary patient or intrusted to its care legally through the so-called commitment? If not sent to the institution, shall he remain in the house of his family or brought into altogether different surroundings detached from all family connections and associations?

In many cases these questions are by no means easy to answer, for one has to count with so many factors: the financial condition, the nature of the case and the social sequels dependent upon it, such as danger to the community or to themselves, interference with the peace and comfort of the neighbors, prognostic and individual factors, such as the feeling of loss of freedom and of being officially declared irresponsible, which in many cases have a demoralizing or depressing effect, etc.

To steer the right course with cognizance and consideration of all these factors, is by no means always an easy task.

It is true that many a time the personal circumstances at once point out the only possible course to follow. If, for instance, we have to deal with an excited, noisy, violent, destructive patient, who at the same time is without means, nothing else remains but committing his to a state hospital. If the patient is markedly suicidal and without means, his surveillance, which in such cases is so necessary and requires such great circumspection that it is very taxing on the relatives, who are striving for a living, becomes extremely difficult. If to this is added the refusal of food, so frequent under these circumstances, and the difficulty of covering the cost of the necessary medical attention, the task soon becomes an impossibility.

If, however, there is affluence of means, even a maniacal patient can be treated outside of an institution, provided that this is done in a house sufficiently isolated acoustically to avoid annoyance to the neighbors and assuming that a sufficient number of attendants is provided to handle the patient. Similarly suicidal cases can be managed privately, that is, non-institutionally, if sufficient, competent supervision can be had.

Nevertheless one must be fully aware that such an efficient surveillance usually requires the services of at least two attendants, one for the day and one for the night, and with maniacal patients this number frequently has to be doubled, if not trebled, unless the patient is kept in a stuperous state by means of narcotics.

I take occasion here to weigh against each other the pros and contras of institutional treatment on one side and of non-institutional care on the other. Both have decided advantages and disadvantages.

One of the incontestable advantages of non-institutional treatment is the absence of the stigma of the institutional stay. Friends and neighbors have then only a vague idea of the disease of the patient and the patient may then be less hindered in his future career, finding less difficulty in procuring a position without having his former stay in an institution pointed out to him directly or by insinuation. This unquestionably is not an unimportant point. Even the humane designation "State Hospital" does not eradicate this disadvantage. On the other hand, with the introduction of psychopathic hospitals, the contrast between a hospital for general diseases and what is now called "State Hospital" will possibly gradually be wiped out.

Another advantage is the omission of the so-to-say official deprivation of liberty implied by commitment. It cannot be denied that many times the latter serves a good purpose by making it possible to keep a patient within bounds without exposing those so engaged to the risk of being sued for damage after his or her recovery; but on many patients the restriction of freedom implied by the name of "commitment" has a decidedly demoralizing influence. As one patient told me, she at least wanted to fully utilize the privilege of the incompetence, that is, irresponsibility, legally meted out to her, by doing things which were interdicted to her before the seal of irresponsibility was officially attached to her. How could she be censured as an irresponsible person for knocking out windows, destroying furniture, barricading of doors and eluding the watchfulness of the attendants by running away? She therefore took pleasure in doing these things and thereby many times getting even with attendants and doctors for actual or imaginery wrongs inflicted by them.

For such misdeeds even experienced nurses often do not show the right understanding. They conclude that such patients know very well what they do and unjustly accuse them of common meanness. They adapt their conduct towards the patients to this point of view and as a result often exercise a very unfavorable influence on the course of the disease.

I cannot help diverging a little with a view of discussing the question of the desirability or undesirability of the so-called commitment.

As I have pointed out already, the commitment frequently has a demoralizing, sometimes a depressing, effect. Many patients entirely lose their hold by it, they say to themselves: "Now everything is lost; I shall never leave the institution again." They therefore do not care what becomes of them and give up hope altogether. Correspondingly, many of them become careless in their make-up and habits, others again unrestrainedly give in to all impulses.

It is therefore a subject of earnest consideration whether the institution of the legal commitment originally introduced for the protection of the civil rights of the patients, constitutes an unalloyed blessing for the latter or whether, on the contrary, it may not turn out harmful to them.

Where there is danger that those in charge of an institution can be made liable for the often unavoidable measures of restraint used, undoubtedly no other course but that of "commitment" is open. Otherwise, however, I would decidedly advocate the voluntary admission of patients. Much can be said in favor of this policy. The patient sees that he still has a say, that he still in a considerable measure, can dispose of his person, that the duration of his stay in the institution still depends a good deal on him, that self-control can contribute greatly to shorten this stay, that one makes a sort of compact with him. All these factors can give him or her a considerable moral hold, the effect of which should not be underestimated. In my opinion, it is therefore to be regretted that partly by laws, partly by regulations of the supervising authorities, the admission of voluntary patients in the institutions of the State of New York has of late years been made considerably more difficult rather than facilitated. While formerly patients could be admitted to private, as well as state, institutions and could be kept as voluntary cases as long as their actions did not necessitate any serious measures of restraint, the rulings are now such that the status of the patient has to be defined, so to say, immediately on his admission; for if they enter as voluntary patients, their admission as such has to be officially reported within 3 days, and if they enter by commitment, then in 10 days. Since, moreover, patients entering as voluntary cases have to sign a corresponding application immediately on admission, which many patients cannot be induced to do at once, one is often compelled against his better knowledge, to see to their immediate commitment in order to avoid infraction of the laws and regulations, a procedure which, as already mentioned, does by no means always result to the benefit of the patient.

In the State of New Jersey the laws and regulations are less binding, which makes it easier to admit a patient as a voluntary case.

Let us return to the original subject after this digression and let us discuss what other advantages non-institutional treatment may have. The doing away with the stigma of an institutional stay has already been mentioned, also the moral hold frequently gained by omission of the commitment. It is true that this omission may occur also under institutional care, but is quite certain in treatment outside of an institution.

The following further point is still to be considered in favor of a non-institutional treatment, namely, the absence of the institutional environment with all it implies. It cannot be denied that upon many, especially depressed patients, the institutional ensemble makes an unfavorable impression. Barred windows, locked doors, the sight of strongly disturbed cases, etc., all contribute thereto. This impression, it is true, effaces itself in a few days, after the patients have grown accustomed to the new surroundings and convinced themselves that the situation is not half as bad as it appeared at first. Indeed the sight of disturbed cases and the fear roused thereby that they may lapse into a similar state, may act in a favorable manner on their self-control. Nevertheless, in certain cases, the depressing influence is a more lasting one, especially if great care is not taken to keep away from them the worst depressing effects and associations and to shape other conditions as normal as possible, which precaution is particularly indicated in the case of suggestible patients with a trend for imitation.

While I do not pretend to have exhausted all advantages of non-institutional treatment with the above, time does not permit me to touch on every point.

What, on the other hand, are the advantages of institutional *versus* non-institutional treatment?

An important point is the total change of the environment and the exclusion of all irritating and otherwise harmful contacts and associations. Outside of an institution this can be accomplished only by strict isolation with the disadvantages connected therewith, and even then only in an incomplete manner or through translocation to another place not too near the original residence. Both procedures often require an outlay beyond the means of the patient or his family.

Closely connected with the point just discussed bearing on the exclusion of the domestic associations, is the one of the institutional discipline. Properly managed, this exercises a very beneficial influence on most patients. They subject themselves to it much more readily than to the authority of the family circle, especially since they see that their fellow patients are being ruled by the same restrictions and that they themselves therefore are not placed in a humiliating, exceptional position. This point is of special importance with patients who at home hold an authoritative place.

The cause of discipline can be greatly contributed to by the voluntary application, if the latter is so framed as to incorporate the obligation on the part of the patient to comply with the general order and rules of the institution. That this discipline should not be a rigid, inelastic one needs hardly to be emphasized.

A further advantage of institutional treatment is the greater facility of doing justice to two factors: first, to the suicidal danger where such exists; secondly, to the refusal of food frequently accompanying it, although sometimes occurring independently thereof. Having already discussed this, I only need to point out again how difficult it usually is to guard against these two dangers, if corresponding financial means do not exist to employ competent attendants. How primitive the protective measures taken by the family often are, you, gentlemen, undoubtedly have often experienced yourselves. A no less important point concerns the narcotics and sedatives, the use of which it certainly generally is desirable to reduce to a minimum. This endeavor on the whole can be attained much easier in an institution. In private, non-institutional treatment the physician, urged by the relatives, often is induced against his better knowledge and belief to prescribe narcotics. The public wants to see results or effects and does not think much of the physician who cannot produce such effects in a convincing striking manner. "If only the patient could sleep one or two nights, then he certainly would improve soon," is a phrase so frequently heard on the part of the relatives and it is very difficult to make them see that their reasoning usually is incorrect and that in most cases the reaction following the effect of a narcotic or hypnotic fully annihilates the rest and sleep producing effect first obtained.

These points are worth mentioning when we consider what difficulties the physician frequently has to contend against in his efforts to carry out a systematic treatment. In many cases he is called in sporadically only and always when things go quite wrong and it is then expected of him that he does something. Thus with the best intentions it is often impossible for him to utilize all auxiliary factors which would reduce or avoid the employment of narcotics and sedatives, especially since he never knows, on installing a plan of treatment, when he will have to cede his place to another colleague on recommendation of one of the patient's 100 cousins of the fifth degree.

Other drawbacks have to be counted with. The complaints of the neighbors about disturbed night rest, for instance, may make it imperative to calm the patient at any price.

All these disadvantages are done away with for the most part in an institution. One is more independent, more in a position to follow his own judgment, carry out a systematic treatment, study the case and correspondingly utilize all auxiliary means of nature for bringing about sleep and general calming effect. Further remarks on the use of narcotics and sedatives I reserve for the chapter on treatment in the narrower sense which now follows.

Treatment in the Narrower Sense.

Psychiatry from olden times has occupied a singular position in medicine. The debate on *monism versus dualism*, the contrasting of body and soul, give a partial explanation for this. Moreover, the organ of mind has such a complicated function that the proper understanding of the latter and of its disturbances, necessitated such an extensive and time consuming study that little time remained for the investigation of the relation between bodily and mental disturbances and the therapeutic application of this study, or, in other words, the psychiatrist could not afford to be an accomplished general clinician, and thus psychiatry in general remained behind the other branches of clinical medicine in point of etiological and therapeutic investigation, and only in later years has it begun in good earnest to utilize the advancements of general medicine for itself and in a creative manner at that.

Important pathways, the extent of which can hardly be foreseen as yet, have been opened up through the discoveries in the domain of internal secretion, of anaphylaxis, of von Abderhalden's ferment-reactions, and psychiatry has already taken good strides in participating in investigations in these fields and making use of them for the understanding and treatment of psychic disease. All the same, the tendency remains to subordinate the therapeutic application to purely scientific investigation and to treat the former as a sort of appendix, that is, the how and why of therapeutic application is still made too little a subject of study; one takes too much for granted that once a disease has been understood or allegedly understood, therapy is a matter of course; or, as my friend, Dr. Joseph Fraenkel, expressed it, too much science is practiced in diagnostic and etiological investigation, too little of it in therapeutic application.

In approaching at first the subject of the concrete application of therapy in the narrower sense, one point must at first be discussed, namely in what measure, if at all, the patient is open to treatment. We must not forget that we have to deal here with a different class of patients than is usually the case in general practice, that we often do not have before us individuals with whom therapeutic measures can be discussed or agreed on. The question therefore always comes up: can we, and to what extent, secure the cooperation of the patient or must we use that of coercion. It hardly needs emphasizing that if the former method can be used the latter should not be resorted to. But here the difficulty arises that the general practitioner in his usual sphere of action hardly has to contend against except in pediatrics. The cases from my own experience who cooperate from the very first can almost be counted on the fingers. To gradually gain the confidence and thereby the cooperation of the patient is, however, a very important point.

It is true that a third mode of procedure remains, that of deception, namely, to either administer something to the patients without their knowledge or to decoy them to the taking of food or medication by means of false promises. The latter method is to be condemned from the very first and it almost unexceptionally avenges itself by failure, and causes lasting harm through the distrust aroused thereby.

The procedure first mentioned to give medication to patients without their knowledge is open to various objections if it does not succeed. If, for instance, drugs are mixed with the food and the patient notices it, one runs the risk to permanently lose his confidence and to give rise to or increase delusions of poisoning, which delusions then can lead to refusal of food. If the procedure becomes known to other patients the distrust created may become epidemic. Otherwise the procedure if used with great circumspection has its justification in as far as if an improvement of the patient is reached thereby the improved condition may facilitate subsequent cooperation. But one must be well aware of the risk involved in this procedure.

I have just mentioned the risk of refusal of food. This is a point with which we have to count and which may make it difficult or impossible to carry through a definite dietetic plan of treatment. This is so much more regrettable since the question of food plays a very prominent rôle in the treatment.

If after due consideration of the difficulties named we put the question, what is the best method of procedure in the concrete case, the answer might properly be sketched in the following manner:

One first takes an observant attitude to see how the patient behaves in general towards his environment, especially whether or not he* shows any distrust against physician or attendants, whether he takes food unreservedly or rejects it wholly or in part. Many patients who do not want to take any medicine show no actual resistance against taking food, they eventually eat whatever is put before them. In this way at once an entering wedge for a dietetic cure, if something may be attained thereby, is given and I may state here at once that for a great percentage of cases a good deal can be done along dietetic lines. For instance, a diet poor in meat and well prepared does good to most patients, so that one rarely goes amiss in prescribing it at once. How to proceed further is to be learned by observation of an experimental character. One places various foods before the patient and notes for which of them he shows greater preference. If such food fits into the dietetic plan or if at least it is not essentially opposed to the latter, the patient may be allowed to have it. In this way one may succeed in creating an appetite in patients who did not have any. How important, on the other hand, appetite is for digestion, has been demonstrated in a most striking manner by Pawlow and his pupils.

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*For sake of brevity, the male appellation will be applied whenever patients are referred to.

If the article of food preferred by the patient disagrees with the dietetic plan of treatment, it is either given in small quantity so as to secure the good will of the patient or a more or less unobjectionable substitute is placed before him. In this manner an impetus is often given, the patient first accepting one article of food, then gradually others. If food is refused on the basis of poisoning delusions, special devices must often be resorted to to get over his resistance against food. For instance, food is given which cannot easily be poisoned, such as whole, unbroken eggs instead of fried or scrambled eggs or the like, or oranges, because these first have to be pealed and therefore cannot be tampered with to introduce poison unless it be done with a hypodermic syringe, etc.

It is often a great mistake in such cases to persuade a patient to eat, for it is just this persuasion that may arouse his suspicion and many a time one succeeds best by not giving the patient any regular meals but by putting certain articles of food like bread, fruit or eggs in his room unnoticed by him. He then often eats them when he believes himself unobserved and subsequently the method is extended to the articles of food most beneficial to him.

Many patients can be induced to drink water by giving them an opportunity to drink directly from the faucet of the water mains, whereas they refuse the water given them in a glass or a cup. They conclude with a show of reason that the possibility of intentional poisoning of the water is a lesser one in the former case than the latter. If, however, all attempts to induce the patient to accept of food should fail, the question arises how long one should wait before resorting to tube feeding. Oftentimes when one meets with a strongly coated tongue and strongly fetid odor from the mouth, it may be a good plan to put the gastro-intestinal tract into a better condition by starvation. Especially when the patients are well nourished and drink a lot of water, which is often the case even if every other kind of food is rejected, it is perfectly safe to wait several days and to produce diuresis and movement of the bowels by means of intestinal *infusions* of physiological salt solution in small quantities (about one-half pint), provided that the patient does not resist this procedure too much.

Likewise by baths, especially prolonged warm or Russian baths, a favorable effect on the gastro-intestinal tract can often be obtained. The patients first become very thirsty and ask for water. Next they get up a desire for oranges, then apples and other fruit, and thus the acceptance of food can gradually be installed. Sometimes when every other attempt has failed, a single tube feeding may be sufficient, acting as a deterrent, so that the patients when they are reminded of it, are willing to take food; but, to reiterate, when it is possible to obtain a result without coercion, such is to be preferred to one reached by coercion even if it should be less productive.

Further hints for the dietetic treatment are gained from the general examination which may show us whether we have to deal with a disturbance of internal secretion, for instance, with hyperthyroidism, in which latter case a meat poor diet with gradual allowance of white meat is of importance, etc.

A subject deserving a little special discussion is constipation, the treatment of which frequently constitutes a very important practical problem in psychiatry.

The more attention is paid to this point, the more frequently does one succeed in reaching satisfactory results without the aid of laxatives for the most part by purely dietetic measures with the addition of some instruction on the physiology of defecation, the influence of habit, etc.; so that of latter years I rarely found it necessary to prescribe anti-constipation drugs except in the beginning of a treatment or in occasional single doses. Here, too, a meat-poor diet with a preference of green vegetables and fruit usually is efficient, but one may easily overdo, for instance, by giving too much fruit and thus by overloading the gastro-intestinal tract produce the opposite result, that is, an increase instead of a relief of constipation.

I have dwelt so long on the food question because, as pointed out, the same plays a prominent rôle and frequently offers the best and easiest starting-point for the treatment.

Other methods of treatment from the domains of hydrotherapy and electrotherapy, I leave out of consideration for lack of time, but wish to say a few words on the treatment of insomnia and excitement with special reference to the use of hypnotics and sedatives.

I took occasion in a previous paragraph to emphasize how difficult it may prove to avoid the use of narcotics in psychiatric cases in private practice. So many new ones are being discovered right along, and again and again one is put on the market which is proclaimed to be an ideal hypnotic, almost identical with natural sleep in its effect, and engendering no habit; but without exception time proves the incorrectness of the claim.

With good reason some authors have compared drug habit with immunization and immunity a process which biologically may have a protective value for the species but oftentimes is very destructive for the individual. The productive, interesting studies on anaphylaxis are likely to have suggested to one or the other the idea to use the principle of anaphylaxis in combating the habitual use of narcotics and sedatives. If the said principle could thus be utilized, surely an important aid would be gained thereby to nip drug habit in the bud or effect a cure in cases of far gone drug habit. Likewise one could think of curing chronic states of excitement through a continually increasing anaphylaxis with narcotics or sedatives in contrast with a progressive immunization.

Perhaps I do not express myself quite clear enough. I wish to say that, if instead of waiting until the effect of a narcotic or hypnotic dose has entirely passed, one would renew this dose while the patient was still deeply under its influence, and if this process was repeated again and again, the result on theoretical grounds instead of being an immunization that is habit formative, might become an anaphylaxis, that is, a constantly increasing sensitiveness towards this narcotic or hypnotic, until ultimately quite minimal doses might still retain a narcotic or hypnotic effect.

It is interesting to note that a method of chloral sleep introduced by Dr. Louis Lichtschein indeed lends considerable support to these theoretical expectations or speculations to judge from his observations communicated to me personally. Dr. Lichtschein gave patients chloral in sufficient doses to produce a deep sleep and kept the sleep in the same intensity by renewing the dose of chloral hydrate about every three hours, thus making the patient sleep continually for 3, 4 or even more weeks. He then noticed that after a certain duration of this sleeping cure the dose of the narcotic given in the same intervals gradually had to be reduced in order to still produce the same degree of sleep and that finally with a minimum dose the patient still continued to sleep and ultimately did so even without chloral or other drugs for a period of about 24 hours with the result of waking up cured.

I have put Dr. Lichtschein's plan of treatment to the test in a case of depressive psychosis accompanied by insomnia, the disease having been of 2 years' standing and having come to a standstill after an initial improvement. In this case a brilliant cure resulted from the application of Dr. Lichtschein's method. It is true that after 2 weeks the chloral treament had to be discontinued because peculiar spastic-ataxic and aphasia-like symptoms developed which made it too uncanny for me to continue the treatment. I therefore had no opportunity to verify the gradual reduction of the dose of chloral hydrate expected from Dr. Lichtschein's observations. The case nevertheless had gained so much ground that the patient with an after-treatment by means of moderate doses of bromides recovered within about 2 months.

I then tried the same treatment in other cases of agitated depressions and maniacal states. I have never succeeded, however, in observing the reduction of dose above mentioned which should, so to say, mark the end of the treatment. Whether the cases were too obstinate and the duration of treatment required for the anaphylactization had not been reached yet, I must leave unanswered. Unfortunately the doses required for the production of continuous sleep were often so large and gave rise at times to such serious symptoms—very suggestive of hypostatic pneumonia or cardiac failure—that even in spite of constant close surveillance of the cases, it proved too dangerous to continue the treatment notwithstanding the fact that in the case which ended in recovery, the existing mitral lesion caused no disquieting manifestations whatsoever, the pulse being, on the contrary, stronger and more efficient than before the installation of the treatment.

It is to be regretted that such obstacles existed, not allowing to carry this interesting plan of treatment to the end. The same was highly interesting, if from no other than a theoretical point of view.

The attempt has been made to produce anaphylactic phenomena by means of narcotic or anesthetizing drugs. But as Richet shows, the suspected anaphylactic phenomena observed in this line always proved to be the cumulative effects of the drug.

If one considers that the state of anaphylaxis sets in no earlier than several days (eventually weeks?) after ingestion of the first dose of the anaphylactizing substance, and that in the Lichtschein treatment, after a certain period, the sensitiveness to the narcotic increases, so to say, from hour to hour, there is unquestionably a considerable difference between the phenomena of anaphylaxis and the increasing sensitiveness to chloralhydrate observed by Lichtschein in the sleeping cure above described.

It is interesting to note, on the other hand, that contrarywise the effect of an anaphylactizing injection could be progressively diminished if the second injection of the anaphylactizing substance quickly succeeded the first one, before the former had had time to produce the state of anaphylaxis and if the subsequent injections were made at similarly short intervals.

Richet emphasizes indeed that in the process of anaphylactization, anaphylactizing and immunizing effects go hand in hand, with predominance nevertheless of the anaphylactizing processes.

Something similar may take place with narcotics, hypnotics and sedatives; that is, they may display immunizing as well as anaphylactizing effects, and, perhaps, by studying the time relations, the intervals between doses and the size of the latter, precise information on these relationships and conditions will be gained.

The domain of anaphylaxis offers, therefore, still an abundance of interesting material for investigation. A branch of it to which I still wish to make some allusion, is the one of food anaphylaxis, since it appears to me that this subject deserves the notice of psychiatrists from an etiological and therapeutic point of view, although the study of the same is still in its infancy.

In an interesting thesis, Leon Barnathon discusses the toxic manifestations which set in in certain individuals after ingestion of certain articles of food, such as milk, eggs, "moules," etc., and which heretofore in view of their still unknown etiology were ranged under the convenient label of "idiosyncrasy." He reaches the conclusion that these phenomena find a full explanation in the concept of anaphylaxis and backs up this view by pointing out the great resemblance of the entire clinical picture to that of anaphylaxis. He emphasizes in this respect the sudden explosive upset, the minimal needed quantity of the ingested substance and the analogy of the symptoms, namely, vomiting, diarrhea, urticaria, nervous phenomena, lowering of the arterial pressure.

As interesting possibilities of these considerations lead one to expect the understanding of autotoxic psychoses, still more worthy of study seems to be the relation between the action of the varoius digestive juices, on the one hand, and the appearance or non-appearance of experimental anaphylaxis, on the other, when the anaphylactizing substances are introduced into the digestive tract. Of interest in this respect, is the observation made by Barnathon that he was never able to induce anaphylaxis by way of the digestive tract, if the anaphylactizing injection was made into the stomach, duodenum or the small intestine, but that he succeeded very nicely in inducing anaphylaxis if the anaphylactizing substance was injected into the large intestine. He concluded therefrom that it was not the effect of the hydrochloric acid alone that prevented the occurrence of anaphylaxis in case of ingestion through the stomach, but that the non-occurrence of anaphylaxis by way of the upper digestive tract was due to the transformation of albuminoid substances by the action of pepsin and the pancreatic enzymes, and that the above mentioned toxic manifestations observed in certain individuals after ingestion of certain alimentary substances (eggs, milk, "moules," etc.), and designated by him as alimentary anaphylaxis, were probably to be attributed to the insufficiency of the digestive juices and that it would therefore be logical to prescribe pepsin and pancreatin to such patients.

In a somewhat different manner, although partly on the same pathways and leading partly to the same conclusions, the problem of anaphylaxis was approached by Therese Bouteil. This author introduced the anaphylactizing substances in dogs and rabbits by different routes, namely, subcutaneously, intraperitoneally, by the cerebral and the spinal routes, and through the digestive tract, and she demonstrated that by all these routes, with the exception of that of the upper digestive tract (stomach, duodenum and small intestine), anaphylaxis could be produced. She showed that the same could be brought about when the first and second injection took place through the same gateway, for instance, by spinal inoculation and re-inoculation, but that it is likewise possible to obtain anaphylaxis by making the first injection into the intestinal veins and into the portal veins, the second one into the general venous system (ear vein in the rabbit, and the saphenous vein in the dog).

Of particular interest is her conclusion that neither the liver nor the mucous membrane and coats of the intestinal tract form a barrier against the anaphylactizing substances and that, as Barnathon likewise concluded, the rôle of making the anaphylactizing substances inocuous in normal individuals falls probably to the digestive juices.

Undoubtedly the results of Barnathon and Therese Bouteil will need verification by further investigations. Let us not forget, besides, that nearly all authors emphasize the uniformity of the clinical picture of anaphylaxis, no matter by what particular albuminoid substance the same is produced. It is, therefore, a question whether when we meet with serious disturbances on the part of the gastro-intesinal tract in psychoses, we have to deal with alimentary anaphylaxes and whether the various psychotic manifestations are to be attributed to such wholly or in part. Perhaps, nevertheless, this uniformity of the anaphylactic disease-picture will not be confirmed; it may, on the contrary, be shown that the nervous and mental symptoms of the same may vary considerably, according to different individuality. If this were so, further research in anaphylaxis, especially in alimentary anaphylaxis, might yet gain a certain importance for psychiatry, since, as pointed out, the food question plays a by no means unimportant rôle in the treatment of psychoses.

If imporant data were thus obtained, the weighty question would indeed come up, how to apply the obtained results therapeutically: for the future will have to show, after all, whether the conditions are as simple as one would be led to expect from Barnathon's conclusion that it would be logical to prescribe pepsin or pancreatin to those individuals who have an alimentary anaphylaxis against eggs, milk, "moules," and the like.

Before closing this paper may I be permitted to say a few words on the relation of the Abderhalden reactions to psychiatry. As already mentioned, psychiatry of late has utilized many of the scientific attainments of general medicine, including physiology and chemistry, and especially in the research field of Abderhalden's protective or defensive reactions has it already conquered a considerable territory. It is true that so far the researches have extended almost exclusively to diagnostic and prognostic, rarely to directly therapeutic, subjects. It is to be hoped, nevertheless, that, as in the case of the internal secretions, the therapeutic application soon will follow etiological and diagnostic investigation. A beginning has already been made by authors like Ludlum and Corson White, whose interesting grouping of cases, especially of dementia praecox, according to their ways of reacting towards the various organs from the point of view of Abderhalden's defensive ferments, together with the therapeutic measures and results based thereon, are greatly encouraging indeed.

The literature on the application of Abderhalden's reactions to psychiatry has grown to such proportions that without greatly exceeding the scope of this paper I can do hardly more than give the main results in brevity.

Fauser, who, according to Wohl, was the first one to apply Abderhalden's reaction in disorders of the nervous system, stated the interesting fact that the serum of cases of dementia praecox digests cerebral cortex, testes and ovaries, and that testicular tissue is digested only by the serum of male; ovarian tissue, only by the serum of female patients. In cases of manic-depressive insanity the said digestive ferments were absent altogether. In later investigations he also occasionally found that the serum from cases of dementia praecox reacted in the same manner against thyroid gland,

and he concluded that testes, ovaries and thyroid gland stood in direct etiological relation towards dementia praecox.

His results were confirmed for the most part by other authors like Wagner, Meyer, Fischer, Roeme and Neue.

Most authors have confirmed that in the purely functional psychoses (manic-depressive insanity, hysteria) no anti-organ ferments of any kind are found. Contrary to these findings, however, cases were observed by Simon of certain neuroses and psychoses which were associated with evident enlargement of the thyroid gland and in which the symptoms on the whole would have justified the diagnosis of dementia praecox, whose serum, furthermore, digested cerebral cortex and thyroid, but did not affect the sexual glands.

It is also of interest that all twelve cases of dementia praecox examined by Fuchs and Freund reacted against pancreas, whereas only eleven of them showed reaction against the sexual glands. All this indicates that the further one penetrated into the matter, the more complicated an aspect did conditions assume.

Many authors indeed reached a grouping of cases of dementia praecox on the basis of the Abderhalden reactions observed and proved that to this grouping a symptomatic grouping corresponded. Thus Wegener distinguished between simple hebephrenia, hebephrenia associated with catatonia, and hebephrenia in which a definite psychic deterioration had taken place. In the first group (one hundred and twenty-one cases) he observed cleavage of the sexual glands; in the second (12 cases), cleavage of the thyroid gland in addition (this was never observed in the first group), and in the third one (96 cases), cleavage of sexual gland and cerebral cortex by the serum of the cases in question.

The above results were partly contradicted by other authors, partly confirmed.

From an especially interesting point of view the question was approached by Ludlum and Corson White, who observed a whole group of cases of dementia praecox which gave Abderhalden's reaction against testis and pancreas; another one which reacted against testis and thyroid, and a third one in which no reaction whatever was obtained. The first named group presented certain physiological characteristics like leukopenia, increased blood pressure, a feeble and rapid pulse, a temperature 2 degrees above normal, exaggerated deep reflexes, diminished cutaneous reflexes, increased electrical reactions of muscle, tremor of tongue and extremities, an apparently good state of nutrition, the Westphal-Pilcz pupillary sign, increased mechanical irritability of the muscles, and dermatographia; furthermore, on examination with the Roentgen rays, seemingly there was less calcium in the bones than in those of the usual run of patients.

A study of Noel Paton's diagram of the inter-relations of the glands of internal secretion led them to the conclusion that in case of a hyperactivity of testes and pancreas, which according to their view corresponded to a positive Abderhalden reaction against testes and pancreas, the diagram is consistent only if the thymus is hypo-active. They then found, aside from the striking similarity of the characteristics above mentioned with the disease picture of thymectomized dogs, the interesting fact that the serum of a dog whose thymus gland had been removed a year previously showed a positive reaction to testis and pancreas, just like the serum of the cases of the dementia praecox group mentioned.

Basing on this agreement they treated several of their patients with extract of thymus gland, and of six cases, three gave excellent results and are at present entirely well.

Ludlum and Corson White found, furthermore, a group of dementia praecox cases which gave no Abderhalden reactions and which from their symptomatology they concluded to be affected with dyspituitarism. These were improved by pituitary extract. Another group they found to react only to pituitary gland and symptomatically they were interpreted as cases of hyperpituitarism. They were improved with the "opposite organic extract, which is the Brown-Sequard fluid."

These are such interesting results and they have such a direct therapeutic bearing that I could not help quoting them quite fully and pointing out how promising are such researches.

A point of special interest and worthy of further investigation is the conception of Ludlum and Corson-White that hyperactivity of a gland results in a positive Abderhalden reaction to such gland.

In conclusion of this fascinating subject, let me add that various authors (Fauser, Wegener and others) found an Abderhalden reaction to liver in melancholia cases. In view of the name "melancholia,'" or "blackgalledness" (apologies are offered for the crudeness of the translation), this is highly interesting and points once again to the instinctive intuition of our ancestors, which, however, was crowded out again by other conceptions.

It is also noteworthy that Abderhalden's reaction to cerebral cortex has been observed in various mental processes leading to deterioration or direct destruction, such as epilepsy, general paresis, and the disease already mentioned, dementia praecox. In epilepsy the reaction was noted either only periodically in connection with the seizures, or, as in rapidly progressive cases, also in the intervals.

If I have digressed considerably from the concrete subject of the treatment of psychopathological cases, the title of this paper, referring as it does to certain points of view only in the treatment and management of such patients, may stand for an excuse.

Park Ridge, N. Y.

THE HOMOSEXUAL PROBLEM.

By

DR. ALFRED ADLER, Vienna, Austria.

LIKE a spectre the condition of homosexuality rises up in society. In defiance of everything the number of perverts is on the increase. Law and religion exert very little influence aganst it. Homosexuality is as prevalent in country districts as in large cities. (This statement surely cannot apply to rural districts in America. Ed.) Children, adults, the aged, men and women participate in the evil. It provides work for the pedagogist, the sociologist, the neurologist and the jurist. All means of conquest have been applied to it without any results worthy of the name being derived therefrom. The severest penalties, the most considerate indulgence, the most propitiating conduct—finally, concealment—every means is without influence upon the spread of this anomaly.

And yet its advocates are not absent. And the many points of view, the innumerable theories all testify to the significant impression of one fact, that a large part of the population are untrue to their sexual rôle Is this a sign of retrogression? Of atavism? Competent observers of animals state that only domesticated animals practice or permit homosexual advances.

Studies in degeneration do not bring to light any useful data for the elucidation of this question, for its important point cannot thus be solved, whether it be through the information afforded by Hirschfeld, Fliess, Freud and others. Who has proved degeneration in homosexuality? Which of the more or less different sex-containing germinal substances belong to homosexuality? Krafft-Ebing's "constitutional disposition" with its clever deluge of words and Freud's "sexual constitution" are nothing more than theoretical postulates of a biased system. But definite occurrences which purport to indicate the sexual direction of the child—taken as a standard according to Binet, Janet, Schrenck-Notzing, Bloch, Moll and others—always show previously existing perversive tendencies so that antagonistic theorists and the patients themselves always begin the history with the words: "In early childhood the following events already indicated traces of hereditary perversion." . . .

Our respect for the investigations alluded to is by no means lessened when we recall that the knowledge of the nature of the perversion is incomplete, and therefore it is not yet possible to lay down a definite point of view in regard to its social significance. And it is because of this fact that we find both among the adversaries and the advocates plenty of clever argument. To overlook this incomplete state of knowledge seems quite an error. Such far-reaching works of preparation and valuable collective material as those of Krafft-Ebing, Moll, Hirschfeld and others will always maintain their high rank even though they may not have been in a position to influence public opinion or legislation.

There is one important point in the teachings about perversion and that is the attitude of public opinion in relation to it. It may be asserted with certainty that no theory is able to exert any favorable influence upon society or upon the social *morale* in regard to homosexuality. The greatest concession that can be obtained is concealment and non-interference. That is as far as the guardians of the law ever went and the many quashed prosecutions on the part of the police show a tendency to indulgence. *The barriers of society against the toleration of the perversion remain unshaken by every theory* for they are formed of the safeguards and social disinclinations of normal feelings. It may, of course, easily be conceived that in these "safeguards" there is a necessary social forbearance, but it must be emphasized that this may easily rise to the point of a refusal of homosexuality to admit the conflict against its own homosexual tendencies. In fact, from an adverse standpoint, the attempt has been made to further increase the number of homosexualists in order to compel the toleration of the perversion.

Just as devoid of reason is the opinion which tries to justify the existence of the perversion and in fact to ascribe a high value to it. Those critics who point to a gradual dying out of homosexual perverts as a result of their perversion still make themselves heard. But the presumption of an inborn quality—which may be regarded as a fable—and the proof which is offered of a possible heredity, prejudice the weight of the argument inasmuch as in mixed cases the heterosexual element may hinder the removal of the homosexuality through natural selection.

The reference to the Greek Eros as compatible with a high state of culture is by no means applicable to the present time. So far as we have gained an insight into the question, it would seem that the Greek "*Knabenliebe*" (pederasty) originated at a time when Woman had won value and influence. The mockery of Aristophanes on "*Knabenliebe*" and the *parliament of women* belong together. When the emancipation of Woman and the awakening of her self-consciousness are increasing, Man is forced to doubt his pre-eminence. *From his feeling of uncertainty and insecurity the conquest of Woman seems to him a venturesome undertaking.* In such cases he possesses many artifices for the *restoration of his security and superiority.* He either *depreciates or idealizes!* Man's reply of protest to the growing self-consciousness of Woman leads, in the first instance, to a *depreciation in the value of Woman.* This "depreciation" explains the Greek "*Knabenliebe*" and its spiritual expression which was *directed against Woman.* A strengthening of this sexual purpose occurred when adult man was permitted to play the rôle of Mentor and protector and the spiritual promoter of Ephebus. In this way the masculine privileges for the boy could continue unhindered. The "fear of Woman,"* inflamed through her endeavors for position, forced Man to a stronger preparation in the sense of his *expansion-tendency.* If "*Knabenliebe*" was an attempt on the part of Man to place a greater "*distance*" between himself and Woman it was for youth—socially—*a preparation for heterosexual love* and companionship.

The homosexuality of our times shows the same fundamental psychologic causes and becomes evident as a *symptom* of the "*flight from Woman.*" But in contrast

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*Adler. *Ueber den nervösen Charakter. Bergmann, Wiesbaden,* 1912.

Adler. *Heilen und Bilden. Rheinhardt, München,* 1914; *further,* "*Zeitschrift für Individual Psychologie,*" 1914.

with the Greek Eros the limiting regulations are absent. The Greek people were a united body, perhaps like another political structure. The Greek idea of state overreached all other endeavors of the people to such an extent that excesses and errors, as they make themselves apparent during the difficulties of development, were ruled with the kindness of familiarity. Hence, through the might of the idea of mutual association the pernicious current of homosexuality progressed in a national direction.

That these side-lights are absent and must be absent from modern homosexuality is unquestionable. At best, a similar relationship is imitated in improper protection or else the youth submits to the tyranny of older friends, or those of equal age waste themselves away with jealous and ridiculous altercations. In short, Greek "*Knabenliebe*" found a time full of reciprocal kindness and the sense of mutual association demanded the showing of what could be given of greatest value by each. The homosexuality of today shows itself as an unfruitful and insoluble product of necessity which further injures the weakly developed common feeling of mutual association. The psychologic factors of homosexuality have been referred to. It shows with these a too little appreciated property: that it is ambiguous and that its significance can only be grasped temporarily and individually.

* * *

The symptoms common to all sexual perversions (homosexuality, sadism, masochism, masturbation, fetishism, etc.) can be found to agree, in accordance with the knowledge of the school of individual psychology, in the following points:

1. Every perversion is an enlarged *spiritual distance* between Man and Woman.

2. It denotes a more or less deep-reaching revolt against participation in the normal sexual act and becomes evident as a systematized or unconscious artifice for the exaltation of one's own feelings of personality.

3 The "depreciation" of the normally anticipated partner is always present. Therefore, *odiousness* and *conquest* are feelings necessary to the pervert.

4. Perversive tendencies in men show themselves as compensatory efforts for the exaltation of a feeling of inferiority against over-estimated power of the woman.

Similarly perversion in women is also compensatory in order to overcome the feeling of inferiority against the greater power of the man.

5. The perversion usually grows out of a spiritual life exhibiting supersensitiveness and over-reached ambition. Lack of deeper companionship and reciprocal kindness are present to a greater degree than is usually supposed. Egocentric emotions, distrust and lust of power prevail. The tendency "*mitzuspielen,*" as well among men as among women, is slight as a result of which there are strong limitations of social interests.

* * *

Whoever is in the position, like the physician, to appreciate the vibrations of the social organism must admit that sexual conduct is influenced by various considerations. Judging from statistics this is expressed in the decreasing number of marriages, in delayed marriage, in the increasing number of divorces. The complaints in regard to these conditions are well-known. When they are examined a multitude of causes are found but they all suffer from the same mistake in that a final cause, a more difficult conduct of life, is blamed.

We cannot overlook the importance of this condition, but as always whenever the individual psychology of a question is mastered, there arises the more generally important question: What individuals are most surely affected in this respect? Are they not exactly those persons of an over-cautious, doubting nature, deficient in self-confidence in regard to their every action and their preparation in life, individuals who, at the sign of the least trouble, are ready to "desert" and "give up the fight?" These are the people who, from childhood on, suffer from a *feeling of inferiority, of self-depreciation (Minderwertigkeitsgefuehl).* They believe themselves lost and remain the "*nervously disposed people.*"

On this view there are two objections to be raised: 1. That every person exercises and needs precaution. 2. That often among the nervous—*i. e.*, for us also the homosexual—we find a great feeling of self-consciousness. The first objection is counteracted by the circumstances that the result of our investigation is not drawn in forcibly, but merely corresponds to a general human attitude which, in cases of nervousness, is obstinate, one-sided and exaggerated. The second objection rests upon a deficient insight into the nature of the neurosis—taking the semblance and the effect for the original nature itself and mistaking one of the fundamental points of the neurotic dynamic: *the heroism of the feeling of weakness.* The sexual "distance" has a tendency to grow. We add nothing new when we state that this symptom occurs in the life of each individual, above all in the nervous individual.

The neurotic who shows what I call an "*attitude of hesitation*" with every change in his situation cannot maintain steady activity under varying conditions. Every hardship, be it apparent or real, calls forth new anxiety in him—hesitation—and he makes attempts at evasion and procrastination. And psychologically there is no difference whether the neurotic, confronted with the problem of love and marriage, the difficulty of making a livelihood or the responsibility incident to posterity, seeks excuse in the unsuitability of the other sex or in his own self-depreciation, or whether he interposes a state of illness, an hysteria, a compulsion neurosis, a phobia, an impotence, a psychosis, a compulsive masturbation or a perversion between his partner and himself. Whether from his unconscious *Lebensplan* he can or cannot make resistance, in a conditional way—for instance, against love and marriage—*he is obliged to imagine a "distance" which he hopes will safeguard him from the dreaded decision he must arrive at.* Just as the wanderer overcome with vertigo seeks "rest" or the one afraid of water seeks "rest" before leaping into the water, so must the neurotic "*distance*" to protect him from the step he is about to take—from supposed defeat. Or, if he seems to gradually approach his goal his feeling of inferiority or *self-depreciation* breaks through ahead and cries Halt! causing him to beat a retreat or go through a circuitous route.

It follows, therefore, that in difficult situations the neurotic disposition furnishes the greatest number of those who are forced to work in roundabout ways in order to save their ambitious ideal of personality. In this roundabout path, moving at a constant spiritual "distance" about the normal but dreaded goal, there comes about an unconscious impulse to complete an *arrangement* by which this "*distance*" would be made secure. But for our theme *roundabout path* and *arrangement* signify the structure of a *perversion built for the purpose of fixing the "distance" from the sexual partner.*

* * *

The theories of homosexuality are based either upon an hereditary factor or upon acquired precocious perversion through an accentuated sexual occurrence in early life which in some way influences the *Lebensplan* of the child.

With the growth of the child its spirit develops efforts towards power and worth. As a rule the environments of the parents serve the child as the strongest figure in its *guiding-picture*. Upon this it bases its own understanding and expectations of the future. It then seeks room for its own development not without the natural "*distance*," however, heightening its *feeling of self-depreciation*. The child's compensatory *Lebensplan* tries in various ways to overcome this *distance* and thereby remove the feeling of weakness. With the means of childish experience at disposal, in which the natural traces of the bodily and spiritual weakness of the child are never absent, it seeks the road to future ascendency.

The continual probing of this individual road is enforced through the *expansion-tendency* of the child. If, at some future time, hate, benevolence and love appear, this is cultivated in the evolution of the child's spiritual life. All the preparations for the hardships of future life—as the child understands them—are created at this time; so also the attitudes towards life and society and the perspective towards the world. Thus different characters are developed—aggression, ingratiation, mistrust, evasiveness, treacherousness, irresoluteness, self-confidence or lack of self-confidence.

From his own limited experience and in imitation of other persons, the child draws to himself all the artifices of the conduct of life and joins them as permanent forms to his own character. Every answer that a person can give on the question of life is essentially influenced by the schema of his childhood. And it goes without saying that all the questions and people he encounters in later life are depicted to him according to the schematic figures of his childhood.

Through the researches of individual psychology it has been shown with indisputable proof that the more one-sided the child's development is and the more abnormal his attitude towards the demands of society, the more strongly developed is his *feeling of self-depreciation*. Mostly the bodily and spiritual, but compensatory, depreciations afford the most significant motive.* Ill breeding and errors in education work just as deleteriously when the child's "*distance*" from the adult is made to appear as if it cannot be spanned. Here also belongs the mistake of excessive authority practiced by some parents.** For instance, a father by bringing up the child too harshly can destroy its spirit towards progress so that the child never attains the self-confidence of initiative. The same result may occur under various other conditions from paternal superiority.

Thus in later life the child is fearsome, lacking the courage to face life's problems. He does not trust himself to advance a solution of these problems except insofar as he can fall back upon his father or until he begins to exhibit a tendency to defy his father's superiority. Hence he finally tries *to triumph over paternal "tyranny."* It must be admitted that this paternal type is found among those men who, unable to exercise their authority upon the outside world, try to impress their superiority upon their own family circle.

Similarly, where the mother is a strong-willed, unyielding woman. The boy develops no trust in himself especially in relation to women. Like the boy described previously, he lacks courage and shuns the competition of Man. Towards women he is hostile in feeling (symptoms of "*moral insanity*" are also quite frequent). This hostility may be so intense that he shows a tendency to evade the problem of love and marriage, inventing as safeguards to this end severe conditions, stipulations or neurotic tricks (such as signs of disease).

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*Adler. Studie über Minderwertigkeit von Organen.

**Schmidt. *Väterliche Autorität und Homosexualität der Kinder. Zeitschr. für Psychanalyse*, 1913.

The female sex is also similarly influenced by the struggle for life, by the stronger competition and so we find that the tyrannical mother who holds her husband and children "pressed against the wall" is most often the individual product of just such a hardened bringing up. As a general rule such women seek their harmonious expression in "*masculine equality*," in an "*exaggerated masculine protest against feminine character*," all of which serves to increase their lust of power and to distort and disfigure their affectionate relationships. Even upon superficial consideration we usually find among such women such symptoms as dysmenorrhea, vaginismus, frigidity, late marriage, a small number of children and nervous diseases that are frequently interwoven with menstruation, pregnancy, labor or the menopause.

* * *

An indelible impression of the "*attitude of distance*" towards Woman is obtained from a consideration of three quite different types of feelings and thoughts of the homosexualist which, however, coincide in their innermost points. The first group, which also embraces his most important spiritual phenomena, concerns his present attitudes. This, however, always bears some relation to the future.

It requires no closer analysis to make the fact clear that the pervert is as little adapted to our social life—in all conditions of life—as he is deprived of the qualifications that his sexual character demands of him. The formation of our social structure is of wide latitude. It underlies the internal conflicts, the contradictions and struggles of human society in the same way as its sexual manifestations. On this account the question of homosexuality comes into prominence if measured according to popular will. It is precisely a denial of this popular will and, indeed, in a most decisive point.

Popular will always bears within itself the *ideal of perpetuation* and from this fact homosexuality and every other perversion is at once stamped as a crime and a sin. And what happens? The unity of a cultural ideal defends itself against such endangering opposition by legal and other means—by laws, penalties and moral condemnation.

Of course, it must also be remembered how easily general condemnation may overreach itself just as soon as an advantageous position of conquest is obtained—or when the sword of righteousness is swung by one who feels himself free from guilt and error—an impeccability which he wants to show off. The question of punishment is somewhat vexed. As further grounds reminding one of care when the punishment of homosexuality is concerned it is emphasized that *the perversion is a collective disease of the individuality* and the danger of punishment lies in the further excitation of it—rarely in its discouragement.

The full-fledged homosexualist always appeals to his historically developed individuality. All his recollections of childhood seem to him to justify his point of view. It is this uniformity in development which has suggested to various authors the false thesis of an hereditary homosexuality. Schrecker and I have pointed out the false and misleading tendencies in the recollections of childhood. The main point of argument for "hereditary homosexuality" falls entirely out of discussion.

In short, wherever we look we see an effort on the part of the homosexualist to dig up proof to establish the *irresponsibility* of his conduct. To pursue this matter further, this shows an active hostility towards society which may be comprehended in the following formula: the aim of the homosexualist is contrary to the requirements of social life. He shows very little of the public spirit and none of the good-will towards others by means of which the bond of unity between people is tied. He does not seek peaceful adaptability and harmony; but his cautious, though over-impulsive, *expansion-tendency* leads him to seek continually hostile measures in the service of which he also places his sexual impulse. In other words, *he has not developed as a partner in society.*

The *second* group which claims our interest because it discloses the active phase of homosexuality becomes outwardly manifest, from the stereotyped stimulus, as a person's temperament, attitude and activity. The homosexual principle is that of *distance towards the woman.* Any contrary excitation encounters so much rigidness and resistance that it acts as an automatic brake—instinctively, unconsciously and so taking every actuality into consideration. The tendency and purpose of such a mechanism is to serve as an attacking and defensive organ, an artificial blocking activity which at all times renders assistance in the direction of "*nichtmitspielen.*"

The *third* group also shows an unconscious, but distinct, despotism which underlies the homosexualist. It is his *low self-esteem* which robs him of all unconstraint. This *feeling of self-depreciation* is often quite unknown to him; but his attitude in life and all his actions make it appear that he supposes its existence and make him ready for desertion at all times. The physician can only gain an opinion as to the range of this feeling when he has appreciated the tragic fate of the homosexualist and his cowardice against normal life, what difficulties he has to contend with which the patient himself often does not realize.

In conclusion I wish to mention that in the mixed cases of homosexuality and heterosexuality, which are not rare, and furthermore the homosexuality of youth, the senile form of homosexuality and that form occurring in boarding schools, prisons and on long sea voyages agree with our conception in placing in a correct light the despotism of the act through the appearance of a seemingly modified irresponsibility. And in these cases also we find the explanation of the heightened *expansion-tendency* which is aided by the always ready sexual impulse.

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II. CASUISTICS AND SPECIAL PART.

I wish to present, in the following, the outline of the case-histories of three patients which, I hope, will afford an understanding of the homosexual *Psyche* and show the correctness of the mechanism indicated above. But first of all, a word on the chances of treatment. They are today as unfavorable as could be. This would seem to be in contradiction with the certainty with which the causes of homosexuality were discussed. But the difficulties of a cure are at once appreciable when we try to lighten our problem and reach this question: What chances of success have we when we try to change a grown-up coward into a courageous man? Upon this hangs, essentially, the therapy of homosexuality. In our case the cowardice is sometimes well concealed or it predominantly extends into conditions of love and marriage. As I do not wish to enter extensively into the question of therapy I just want to emphasize that the treatment,

1. must eradicate the deeply-rooted imaginations of childhood.
2. The patient's *distance* from his sexual partner must be clearly demonstrated.
3. His antisocial attitude must be brought out prominently.
4. His aim towards superiority must be unmasked and destroyed as a fixed Utopia.

This entire bringing-up process requires the greatest pedagogic delicacy of feeling and the most cultivated methods. I believe I will find concurrence in my conclusion that *the eradication of homosexuality is a question of the bringing up of the child.* The nursery is the important place where the child's courage should not be taken away, where the questions pertaining to his future life should not be befogged and establish securely and unalterably his sexual character. Especially in this latter point is there much to be desired. It is probably no accident that in all my cases I have been able to reveal in the history a striking insecurity in the sexual character. This childish uncertainty seems to me to be the principal condition in the previous history of the homosexual.

Case I.

In this biography the fundamental schema indicated by me comes into distinct evidence: the superiority of the female portion of the family, the inconvenience of the sexual organs, the uncertainty of the child in relation to his sexual rôle, the hope of a modification of the same and the line of direction of his avarice and despotism, causing him to seek triumph in roundabout ways.

"...........I grew up with my older sister who used to use me as a plaything in her games. One of the games especially is painfully in my memory. *I was the cow and she would milk me from my sexual organ.* On my complaining to the governess an end was put to this game. As children we would enjoy riding on the knees of our governess or even so on the knees of some gentlemen friends of the family, and would give vent to our good feelings with shrieks of delight. But contrary to my sister *my sexual organ was always in my way.* I then found a more convenient make-believe horse: I would stick a cushion between my legs and gallop round around the room for hours long. My sister eagerly joined me in this play and *we were quite in love with our cushion.* Later on we made believe that it was an infant *which we would place to the breast to nurse.* We also would suck the corners of the cushion *which finally turned into a perpetual competition with the household belongings.*

"As, for purposes of health, my see-saw was taken away from me. I pondered over this and concluded that there was a connection between this measure and my sexual organ and I made the peculiar observation that *I could make the testicles disappear into the belly. I then tried to do likewise with my penis, which I succeeded by strong compression.*

"As a youth I wanted nothing more ardently than to be of a *double-sexed nature*, so that *as a man* I could have striking intercourse with men and *as a girl* I could rule over them.

"As a 12-year-old boy I used to like to play around in the stable with the coachman and the stable-boy. There I often had the opportunity to see their sexual organs and in proportion to mine they seemed to me of giant's size. One day I witnessed the stable-boy insert his arm into the sexual organs of a mare. All these big dimensions confused me so that *I became anxious about my future.* I felt that I was not disposed to be satisfied to play a subordinate rôle. I was very avaricious for honor and stubborn. When my sister and I used to drive I always gave the directions, and in fact compelled her to look only in the direction *that I pointed out to her.* One day—I must have been about 12 years old then—I was seduced by the stable-boy, and so my first homosexual act came about *which filled me with exceptionol pride.* And it remained so until the present day. *The power that I exercise over men fills me with tremors of delight.* Shortly afterwards I had homosexual intercourse with an older staff officer who always had been heterosexual. I experienced great satisfaction when I saw him before me afterwards entirely exhausted."

Case II.

A 26-year-old, strong, somewhat dreamy and bashful appearing man presented himself before me as a homosexualist with the question whether I would advise him to marry. Questions of that kind are usually pretexts, when addressed to a neurologist. Further inquiries brought out the fact that he regarded homosexuality as unalterable and he amplified his views with a whole series of citations from various known authors. I do not want to say that the dessemination of false conceptions in this respect does *polpoble harm*. But with a perversion built on a desert of mistakes so that the patient is imprisoned in superstition, such authoritative assertions—as of the incurability of the homosexuality—serve to sustain the patient in his misconception. With this statement it is recommended accordingly to hold back somewhat the expression of our point of view.

When questioned as to his life's history the patient stated he is the son of a peasant woman and that his father is unknown to him. His mother gave birth to another illegitimate child and later, in honorable wedlock, to two other girls whom, as a little boy, he had to mind day and night. This task he found unbearable and it filled him with a great deal of displeasure. He recalls that not alone these two little girls but girls and women in general *oroused in him a feeling of onimosity*, and they, he argued, *were to be blomed for his ill-fortune.* To this aspect of the world certain remarks of his grandmother contributed in which she branded his mother's character. Simultaneously with this attack and with his own sorrowful experiences to which his mother herself conducted in placing him in service to the two girls, he heard it expounded, particularly by his grandmother, *how reprehensible love-relotionships ore.* He understood all this to mean, not any differently than other boys or men, *how much one must guard himself from women!* Thus, together with his own fate, he had implanted within him the necessary preparation towards perversion.

We can best understand his method of reaction to the *feeling of depreciation* when we hear that he, the despised boy, determined to become a clergyman, which signified nothing less in that village than being *the first man* in the village in which he lived. Furthermore, this childish phantasie of profession shows us that already at this early stage his goal (as a Catholic) sought to withdraw him from Woman and Love.

In the public school he was the most diligent and gifted scholar and with slight effort he was prepared to enter the gymnasium (grammar school of the first grade). But after the second class which he also completed very successfully, his guardian took him out of school and *set him to work taking core of geese.* This boy's destiny, as we see, was by all means unsuited to make him a proper *portner (Mitspieler)* in society.

For two years long he took care of geese. Finally, strangers interested in him, prevailed upon his guardian to teach the gifted boy some trade. He wanted to become a mechanic. His guardian forced him to become a weaver's apprentice. After a three-year apprenticeship—he was now 17 years old—he forsook the weaver's trade, a determination that he had decided upon long before, and entered as an apprentice in a technical factory. At the same time he studied industriously at a technical school and succeeded, with his efforts, to obtain a favorable position.

While he was still a weaver's apprentice he found a friend in whom he placed greater trust than in all other people. At the same time his *feeling of personolity* became so broadened that he found it possible to exert his influence upon any person. It's no wonder also that his adult impulse assumed that direction *corresponding to his previously unfovoroble ottitude towords life: distonce and o tendency towords women.* He felt a special attraction towards his friend because he was the first person to greet him with love and at the same time, under the lash of his sexual impulse he tried to win a dominating control over some person. So he was "the despised" person, set back everywhere, but with a *lust for triumph*, the seducer of his friend and an *active homosexualist.*

Later on he occasionally had normal intercourse. But he always looked upon it all as a failure. For example, after normal sexual intercourse with a prostitute he found the act odious. However, we find this feeling not only among the homosexual. Our patient, however, regarded his disgust as a sign of "inborn perversive tendency," and *felt himself so much the more bound to it.*

For some time he has been approached on the question of marriage. He became engaged to the girl introduced, but he felt repulsive and awkward about it so that the option was given him to break the engagement if he chose. Just as soon as he became engaged he came to me with his "hereditary homosexuality," not so much for purposes of cure as for a substantiation of the disease in order that he be justified in withdrawing from his betrothal. *In the meantime he felt in love with a 14-year-old girl—perhaps just to gain time—and broke his engagement.* His old fear of and disinclination towards women which had grown upon him through his peculiar destiny remained unovercome but not unalterable through treatment.

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In these two cases I am quite far removed from a desire to speak of a cure for homosexuality, but in both cases the treatment was successful in diminishing the *distance* between the patient and the female sex. In the second case the outlook seems favorable that in a short time an essential transformation to the normal will occur. But I want to warn against an underestimation of the difficulties relative to the prophylaxis of homosexuality and the uncommonly difficult therapy. On the other hand it is certainly to be emphasized that the presence of the difficulties should not act as a deterrent to therapy.

In the above cases the first one inclined more towards a feminine character; the second, towards a masculine character and the apparent fixation of the homosexuality was shaken at once. Both patients became heterosexual, although, to be sure, incompletely. We must not forget, however, what a spacious time the normal youth requires in preparation in order to make his sexual function sufficient. The improved patient must also be given sufficient time.

With many of the homosexual, treatment becomes absolutely necessary for another reason. Those are the cases in which, accompanying the homosexuality, there are other such conspicuous neuroses that a cure is vitally demanded. In the two cases described above there were numerous symptoms of a nervous nature which had their existence in the *fear of society*, such as hypochondria in the first case, and insomnia, blushing and bashfulness in the second case. These facts are particularly distinct in the following case which also shows the manifoldness of the perversion emphasized by many authors.

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The most important view that I have arrived at from a study of the neurotic and psychic significance of the perversion lies in the growing comprehension of the sinister, often well concealed *obstinacy* of the patient. This becomes evident during childhood as a stronger, in later life as an overpowering, sensitive social demand. We will have the opportunity to study the childhood form of this obstinacy as a deplorable result of improper bringing up. The remarkable thing will sometimes happen that the worthiest boy will fall into obstinacy and negativism in order to get rid of his feeling of self-depreciation and outgrow his father. This may all happen from the false conception and the wish to become a *full-fledged man.* The child's entire will and behavior may point predominantly in the direction "*dem Vater das Spiel verderben*" (literally, to spoil the father's play, *i. e.*, to spite the father).

There are now two possibilities of further development. The first is, if the father is lovable the child will conceal his spitefulness although in his behavior he will operate *against the expectations of his father*, by showing a persistent ineptitude and incapacity. In the second possibility, where the father is severe, this severity favors a period of open defiance until the child loses his belief and confidence in himself. In the latter case, however, there is developed a strong line of precaution, the psychological reason for which is that the child tries not to lose his feeling of personality in comparison with his father.

This line of precaution always leads to the important social problem, the attitude towards Woman, in a decisive way. The road is free to neuroses and under favorable circumstances to perversions.

To recapitulate we can say that in the previous histories of the homosexual besides the described tendencies (uncertainty of sexual character, weakness of decision, the construction of a future life without Woman, consuming search after triumphs), a conscious or unconscious attitude of hostility towards the father is never missing.

I want to mention another slight symptom that we frequently encounter in the homosexual as well as in other neurotics which is explained by a secret ambition and at times may lead to the well known forms of false benevolence and sympathetic sensibility. It is the tendency of bestowing continual favors and *patronage,* such as giving advice, small obligations and help, charity, warnings and other favors. For instance, the patient, out of solicitude for the passer-by, removes a stone out of the road, or he calls attention to a nail or a bit of broken glass. Or he will brush another's clothes or straighten his cravat, etc—all out of pure solicitude for the other's welfare and appearance. Such an individual gives the impression of a very careful personality whose obtrusive altruistic enterprises may become a burden and an intrusion. This extreme carefulness and benevolence becomes suspicious because it is so overdone and exaggerated. The patient takes everybody's troubles on his own shoulders. He acts for everybody and desires to relegate everyone else to passivity. He is the manager of all. This impression is extraordinarily strengthened by psychologic investigation—how there is intermingled in all this a spying, secretive, grumbling, fault-finding attitude in the conduct of the patient. This greedy, predominating, aggressive, softening attitude seems snake-like and I have very often, in homosexualists, been able to find this serpentine quality as a *compulsive-activity* moving in a devious, roundabout path when confronted with a problem that appears difficult. In the following case this compulsive-activity is present.

Case III.

Case III. This patient introduced himself to me with the information that he is homosexual and suffers from terribly compulsive thoughts. These have interfered with his work—he is a private officeholder—to an uncommon degree. In fact, his professional accomplishments, his studies of business have been upset by them. He took up the study of the mercantile line shortly after the death of his father so that he could progress more rapidly in his career. He has to support his mother and himself.

For his age (25) he seems rather weakly, delicate, pale and he has Hutchinson's teeth. Questioned as to his father he stated that he had died, in the course of a paralysis, from an accident. The patient is the only child, and was born late in marriage. His mother was about five years older than the father.

Syphilis as a cause of numerous injuries in development, which may affect all organs, is substantiated in the works of pathologists and pediatrists (see, for example, Hochsinger's works). It is therefore perfectly comprehensible that in children of luetic parents in the course of a sickly childhood a feeling of self-depreciation may appear. The anxiety of the parents over the sickly child aggravates the situation. In other cases, again, the father, *from his feeling of degradation over his lues,* establishes a state of fear or cultivates an hypochondria. But this feeling of weakness and uncertainty always takes the upper hand in the soul of the child.

In our patient's home there prevailed an ideal family life. The parents were intelligent, lovable people and the mother, who hardly permitted her only son away from her side, understood by friendly acquiescence how to cause her husband's occasional moods and ill humor to disappear quickly. One fact stands out prominently in the recollection of our patient, namely, that he was weakly and always guarded attentively and was affected with some defect of speech, over which his relations would sometimes make fun.

He narrated his development by which we were able slowly to obtain a guide on his *Lebenslinie*. There were some markedly great purposes therein. His mother was given over to his rearing and attendance and he himself, when three or four years old, counted so much upon this devotion and tried to foster it so, that later he felt sadly injured *when his mother was not with him*. We see here that error of bringing up which most often tends to undermine the child's self-reliance and makes him a coward towards life. With this attitude of his mother another fact is in accord, namely, that his mother always openly distrusted the servant girl and never gave our patient the opportunity to be alone with any girls, in fact would frighten him from them with words. And so it happened that he, who exercised a control over his mother, was early and definitely denied a forward social direction not because he believed that he had to win a great deal of control, but because of distrust.

On the other hand, another remembrance will serve us as a guide to his spitefulness and rivalry towards his father and which shows us, at the same time, that the mastery over his mother was insufficient. He slept in a room which was adjacent to his parents' room—he was then perhaps six years old—and as his parents retired he sprang out of bed in a fit of anger, such as he had never had before, and grabbing a stick he pounded so long on the stove until his mother came to quiet him. He also recalls that often before falling asleep he would call his mother and ask her to do all sorts of things for him.

This tendency, to master his mother and place her in his service, thus securing for him a cheap feeling of despotism, occurred shockingly often. Freud could easily disclose an incestuous tendency and change all the patient's outward manifestations into sexual language and thereby obtain what he calls "the sexual etiology of homosexuality." Our patient, however, states that until he was twelve years of age, probably as a result of his mother's close guardianship, he lacked all *knowledge of sex*, every interest and every motion. His father's incitements he endured incomprehensibly, helplessly and perhaps also spitefully. Moreover, we can easily understand that this child sought a support for his feeling of inferiority, which he found in his mother, and that he did not grasp onto his father because his father was less qualified to respond to him. I shall leave the judgment of the fact to the more experienced judge of the soul of children as to why this boy had to lean against his mother, as the arbitrariness of the Freudian school deduces the spiritual development of the boy, in all its ramifications, from a sexual impulsive incestuous tendency.

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In this current, in which the soul of the boy should develop, there lay not only the motive to extend his tyranny over his mother always further but by means of love, and at times of anger, to bring himself to appear of value to her. The antithesis of the father is also sharply outlined, but as he avoided exercising any impression on the boy, open defiance or open hostility was dispelled. To avoid doing so altogether was out of the question, for the father's superiority, from the very nature of the thing, oppressed the boy in reserve so that when he would ask his father's help in mathematical problems he would always, perhaps unconsciously, through an affected incomprehensibility, stir up his father's anger and excitement.

The circumstances already mentioned of the patient's bodily weakness also tended to aggravate the situation insofar as the father was exceptionally big and strong. The antithesis was further increased when the father would urge the boy *not to behave like a girl*, always hanging on to his mother, but that he should act like a boy and play with boys. We can understand that because of the father's deep-rooted antagonism he was unsuited to be the proper leader because he always had to contend against the boy's resistance. But for another reason as well the father was bound to be frustrated. This is the same reason that the treatment may be liable to frustration because the patient, as an insecure child, so built up his compensatory ambition that *he is only able to follow such paths as bring out his own superiority and not that of his father, or later, of the physician.*

Thus we see, just as generally with nervous children, that the boy is liable to fall into a condition of *compensatory negativism*, into an openly defiant, distressed, *sadistic* character. But through the lovable and friendly conduct of the father this possibility was closed to him, who, as a matter of fact, by his persuasion and tenderness tried to bring out his talent. Against this behavior there remained with the boy but a single counter-move: to increase and receive, in similar by-paths, his father's love in order to make secure his control over him also but at the same time with the quickly learned stenciled passive attitude and inaptitude *to destroy his father's demands of him for manliness.*

In this mental condition, the single proof of which is his despotism over his mother and her subordination to him, signs of ascendency over his father must also appear, every action and every disposition being conditioned through his fictive or imaginary goal, namely, *his lust for power, notwithstanding his bodily and childish weakness, by evasive, indirect and stealthy means—never by direct aggression or challenge.* Some fighting disposition may perhaps be reconstructed which show facts and preparatory actions that could later be converted into realities or which help to comprehend early the course of his phantasie. So, for instance, as a child he would first disarrange his pillow, then his coverlet in order to find a reason to call his mother and thereby draw her away from his father's side; in later life, as an adult, the same propensity is evident when he tried to persuade his mother to separate from his father upon whose faithfulness he attempted to cast suspicion.

His measures were, as we see, cunning and secretive. He never trusted himself to open action. Hence he necessarily had to manifest manifold, often double-cleft relations and apparently very contradictory characteristics (the misunderstood "splitting of personality" of some authors) which, in a similar way, were based on the demonstration of his superiority. For instance, he had to show so much love, diligence and effort that he would not lose standing in the eyes of his father and mother. *Afterwards he demolished it all.* And on the other hand he persevered in so much underhand spite-work against both of them that they both continually had their hands full with him. *Subsequently he also possessed his spitefulness,* as well as some incapacity. He showed other evidences of the neurotic, such as enuresis, stuttering or masturbation.

Phenomena of this sort the physician must expect and explain in the treatment; for in the psyche of the neurotic there are certainly found the most contrary emotions: love and hate, defiance and submission, tyranny and resignation, sadism and masochism, activity and passivity, homosexuality and heterosexuality. All these are only *means* through which to attain superiority. Once this imaginary end result is reached all the contrariness disappears!

If we wish to convince ourselves again whether we have found the right path we must seek aid in further recollections of childhood and see if in them we again find the same, and only the same, path. For example, in the "never-to-be-forgotten dreams" of childhood, in the expectation there to find the basis of the patient's tactics. One such dream when our patient was six years of age was thus: "I was climbing a mountain upon the summit of which my mother was waiting for me. I mounted it *serpentinely*. Behind me a man was following the same route. He was dressed as a guardsman and I had the feeling that he wanted to do something to me." If we interpret this dream disinterestedly we find that it denotes (1) an upward endeavor, (2) the struggle to the mother, (3) the secrecy and slyness of the by-path, (4) the hostile position of the father.

A second dream, when he was seven years of age, was thus: "I was walking with my father in the street. Behind us a person was coming who acted as if insane. He struck off the heads of all the people." This dream, which cannot be well understood without some presumptions, is at least surely evident in one respect, how full of danger our patient regarded life outside the house ("in the street").

If we further take into consideration the preparations of this boy which pursue so distinctly the line of "security" and the soaring to superiority above all others, we must expect to find it again in all other fields of his activity. Above all it must occur in his play and in his favorite occupations because these are grasped prominently by the child as "preparatory acts" towards life. As a matter of fact the patient states that he never, or only under compulsion, would play with other children and that from his earliest childhood would play, almost exclusively, with railroad train games and that the mechanism of the train interested him especially.

From previous material (see my work "*Heilen und Bilden*") I must admite that this inquisitiveness of the child based on mechanisms gives rise to a great *uncertainty in regard to his understanding* which demands a seeking and feeling ease of mind. At the same time we understand that such application would not evince a combative nature in the way numerous other applications would establish. Is not this the same impression that the father complained of, that our patient behaved more like a girl than a boy? If we recall the patient's tender exterior, the curls that he wore, the girlish dresses he wore until his fifth year and that almost until puberty he had no clear understanding of the distinction of sex or even of his own sexual character, the impression becomes stronger that the uncertainty in his understanding, also in relation to his sexual character, acted as an aggravating factor.

In regard to girls I can make the analogous assertion that fighting and scuffling, climbing and running, excessive sport and dreams of such performances, as Smith and Stanley Hall have emphasized, point to a discontent with the female character and to a "male protest" against it. In the picture of our patient a new, aggravating note comes into view, which again convinces us, that he, uncertain in his understanding as to his future sexual rôle, *renounces the masculine striving for power.*

In his uninfluenced communication the patient states that when he was about ten years old he got the notion that when a child is born the mother's belly bursts open. At the same time he suffered from a *phobia that the boiler in his toy railroad train might burst.* Here we find, in the form of a phobia, a concealed train of thought and emotions which necessarily carry within them a protest against the female character. From still another circumstance was it possible for him to have to play a female rôle. All his childhood days were taken up in association with a six-year-old girl cousin who influenced him by her exceptional energy, courage and attention. Most often they used to play marriage. Our patient had to play the character of the "*bride*" and would wear a long train, whereas the girl would take the part of the "bridegroom." That is as much as to say that the boy's *organ-inferiority* found him girlish and that as a boy he was uninfluenced. In consequence he quietly accepted the tacit view that *he could decide to assume either a masculine or a feminine character, i. e.*, he was uncertain as to his sexual character.

If we take into consideration this uncertainty as to his sexual character (a result of his seclusion through his neurotic mother who herself turned to her feminine character at a late date and feared a second child, perhaps from the excessive anxiety occasioned by the first child)*—a result, moreover, of the luetic father's anxiety for the future, and who decided too late to allow the boy to run around freely—we have before us the development of an organically inferior child whose feeling of deficient manliness was supported by nervous family tradition until it found the way *to accumulate and heighten the feelings of inferiority in order to discharge them afterwards towards a goal of the most ambitious endeavor: to evade the test (of masculinity) through femininity and yet gain ascendancy over men by the female attitude and feminine means!* When the patient was sixteen years old he often played a female part in a school dramatic performance. He was admired by his school comrades and he flirted with a stranger, a visitor, who took him to be a girl.

Previously, when he was twelve years old, an event occurred which decidedly strengthened his unconscious renunciation of woman. Since eight years old he had tendencies to masturbation—thigh masturbation—without any seduction in play, a thing which in this form of masturbation is perhaps always found. Four years later he discovered, while having sexual contact (mutual onanism) in a bath house with a school comrade, that he had a phimosis. To an ambitious boy such an affection seems like an awful defect. This incident shows what was first described by me as contemporary sexual self-depreciation or inferiority, the phimosis appearing to the patients as a sign of peripheral degeneration because of an inferiority somewhere else.* The patient therefore brings together all his natural resources to forsake the pursuit of woman because the means of sexual force appears prejudicial to him. From this time on woman ceases to play any influence or importance with him because he believes that he is incompetent to make a decision.** He is now led closer to the side of man at some future day to enjoy plain homosexuality.

Upon this decision he did not come suddenly, much less was he surprised by it. *A whole series of preliminaries* in which his active participation was indispensable show his active tendency towards perversion—to be sure, in a manner in which he can renounce any responsibility, *in a manner of selfdeception*. Of his preliminaries I wish to emphasize the most significant: neurotic, prejudicial grouping and valuation of facts, depreciation of woman and "hardening measures."

When our patient was sixteen years old he had his first homosexual experience. At this stage he was already initiated into all the secrets of sexuality but towards girls in general he was cold. Upon closer inspection this statement seems incorrect. He had rambling tendencies towards girls but never did the patient grasp the possibility

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**Studie über Minderwertigkeit der Organen.*

**I have been able to demonstrate a similar psychic mechanism in fetischism, masturbation and other perversions; even in cases where the choice of a partner is absent it lies deep under the social rank of the patient.

of anything more than purely companionable approximation. In consequence of his *Lebensplan* he needed *distance* towards girls *and he made it.* By exaggerating the difficulties, by prejudicially emphasizing the girl's faults, by incorrect confirmation, as it was shown later, of her indifference towards him, by self-misrepresentation as to female artfulness and cunning he always succeeded in frightening himself away and of deadening every germinating interest. At the same time he learned the air, the manner which had to frighten girls and it governed him instinctively. And so much the stronger did he place the degree of attraction that boys exercised upon him either during excursions or bathing. For a long time he did not overstep platonic wanderings, usually kissing and embracing. Twice, he recalls, he practiced contact of the genitals. These, which he managed after searching reflection and diplomatic preparation, he looked upon as a sign of Heaven and confirmed his belief in his hereditary homosexuality.

His excitations led him mostly to thigh masturbation which his father sought to restrain by veiled suggestions. At puberty when he was fully homosexual he bound up his sexual excitations always with *homosexual phantasies, which concerned more especially delicate boys whom he could lick without any effort, or strong, giant men who, overcome by his charm, were compelled by him to place themselves in his possession.* The imaginary act displayed a situation in which—fully realizing the incongruousness of it—he would exhibit a change to a female nature or else (this phantasie becomes established more interestingly later on) he would practice reciprocal fellatio.

This developmental condition requires closer consideration. If we accept as solved our task in tracing back the homosexuality to a feeling of insufficiency, or if we regard as established the attempt to more easily attain the imaginary ideal of superiority through a renunciation of woman we become as much confused by the pervert's occasional inclinations towards pretty girls as are the adherents of hereditary sexuality. If we inspect it more closely we find that the patient systematically depreciated the real natural emotions of his masculine character so long, *until he was no longer conscious of them.* And he intentionally ligated every inclination to bring the female sex closer to him because it was dangerous to his neurotic *Lebensplan* ("plan of life"). The principal weakening of his activity lay so closely to him that he furthered it until he was hindered in every initiative against men. He came into homosexual relations with three men but never was he aggressive; his conduct was nothing more than timid coquetishness. In his childhood, as we have seen him, instead of leading an open struggle he always remained, even until treatment, the *object of conquest.* He never had the opportunity to learn aggression and in relation to love he had lost complete confidence in his power. The last possibility came about through the phimosis which appeared to him as unmanly. Hence he returned to the impulse of his childhood, *to feel himself the stronger by eliminating woman and conquering man through ways of slyness and the application of feminine means.*

In the wish to rule his mother this result could not occur, for his father had stronger reason and greater influence, and so the childish scene when he furiously pounded on the stove shows us the feeling of his defeat against his father. If he now had any tendency towards girls it was only to exercise himself in resignation in order to build more securely his *distance* towards the female sex and to learn how to drop quickly loosely bound connections. This artfulness in "hardening," an ingredient of the preparatory safeguarding tendency, is of the greatest significance in the mechanism of the neurosis and teaches us impressively how the once established individual *Lebenslinie* of the neurotic and its goal become decisive. They group the reminiscences, lift up experiences to rank and dignity or plunge them into oblivion, crumble their significance, heighten sensibilities or extinguish them, utilize weakness and defects for feints and artifices, whip up impulsive life or mould it otherwise, give rise to licentious emotions, perversions, fetishistic characteristics, or let them disappear again after a bare existence and signification, and are at all times in a position to make something out of nothing or nothing out of something.

It is a well established fact that the spiritual life of the neurotic—and hence also the neurosis itself, without necessarily any knowledge of its mechanism—lies so clearly before one's eyes that it is more likely to be overlooked.

It is also found in the voluptuous masturbation of our patient and we can well assert that his homosexuality was first made possible through the arranged homosexual preparations in his phantasie which also served for his masturbation. The whole attitude of his later homosexuality can be found and demonstrated as preparations in his masturbatory phantasies, in fact also, in his former dreams. It therefore follows that the neurotic symptom of homosexuality, just as all other symptoms of the neurosis, is *worked out and arranged*, and that it is joined together with the manifold proofs of the patients unconscious *Lebensplan*.

As to the significance of masturbation in the neurosis (I shall take up a more conclusive consideration of this perversion in another paper) we see the following throughout:

1. Occasioned by real irritative conditions it is made at once utilizable for the neurotic schema.

2. The accompanying feelings of guilt help to set masturbation in its right light or to safeguard against an excess; they are also proof of the "overtowering sexuality" of the patient.

3. The accompanying phantasies are to be regarded as preparations betraying the goal of the neurotic from which he is frightened away.

4. There is a feeling of inferiority or fear of defeat, both culminating in a fear of the sexual partner and an attempt by the patient to postpone his decision.

In regard to the latter point, the fear of decision, we find in our patient a great deal of restraint towards aggression as in his life in other respects. His restraint towards his equal sexual partner is exactly as great as his *distance* towards life otherwise—an agreement which shows us that we have correctly determined the patient's *Lebenslinie*. Was not his previously described attitude towards his father, mother and Man unconsciously and invariably determined by his feeling of inferiority, by his fear of decision and by his highbridled goal to govern his surroundings? Also, his superfluous artifices, the ingratiation—in a snake-like way—his secretive spitefulness, his partial, assumed incapacity when questions of any sort confronted him, his change to unmanly or what is the same thing, "feminine" ways, especially his well prepared grasping of a homosexual direction with all the successive complete individual characteristics belonging to it—*all these give evidence that the patient so managed his real thoughts, feeling and desires until he met his "correct" choice of neurosis.* In view of the heretofore unsuccessful attempts to understand the choice of neurosis I wish to point out from my investigations that: *the patient finally acquires that neurosis which corresponds best with his fictive goal and the Lebensplan belonging to it.*

As our patient had gone so far as to have mutual onanism with a school comrade in a bath house he had to make a further arrangement by which to secure and hold fast his homosexual development. Hence he bestowed upon homosexuality the most enchanting allurement, prized it as the highest form of love and depreciated the normal which he tried to regard as low, common and bestial. In this he also obtained force from his *Lebensplan.*

In my work *Ueber den nervösen Charakter* I have described extensively these allurements, falsities, depreciations and overestimations in the mental life of the neurotic as preparations and arrangements *for the purpose of heightening his own feelings of personality.* The "hardening measures" prepared our patient for other degenerations of the homosexual, namely, for mutual fellatio, to extinguish the last trace of aversion and resistance and through this perversion to give to homosexuality, so to say, a higher sanctification. The following event occurred which puzzled the patient: he awoke one morning with a dim recollection that he had drunk urine from a tumbler. Remains of the urine still were in the glass. This happened at a time when he resisted the efforts of a friend to induce him to practice fellatio. Soon afterwards he became yielding.

Between these two homosexual experiences two others slide in from one of which I wish to point out the proof of his lasting passive rôle. One day our patient pushed against a man in a public lavatory who had first struck his attention by his worn out coat. (The outwardly minutely exact and stylish clothes of many homosexualists, also shown in our patient, shows us the underlying feeling of weakness which seeks to become compensated by outward show and at the same time act as a bribe). The eyes of both met and they understood each other. This condition of mutual recognition between homosexuals is rather puzzling. They very seldom mistake each other. To my questions in relation to this I always receive general answers. "*Der Blick bleibht hängen!*" ("The glance remains steadfast") is the way most of the patients express it which, however, expresses the fact rather than the cause. And yet in view of the numberless preparations of the homosexual this positiveness of judgment is not hard to understand. The act of recognition is evidently unconscious but under the constant feeling and testing of the glance it becomes a sort of easily understood question and answer. The eye takes over the task of expressing mutual comprehension and preparation. Notwithstanding that our patient was sure of his man he drew away from the pursuit of the pursuing homosexualist, abandoned the plan to get better acquainted with him as foolish and went away with admonishing thoughts for greater precaution. In his subsequent relations he was never the seeker and always exercised the greatest precaution. Shortly afterwards he fell a victim to an extortioner who accused him unjustly of having made unlawful advances. That this experience strengthened him in his passiveness we can well understand.

He hardly had entered the high school, when his father died. This forced him to seek a position. We will not be surprised to learn that the patient, who wanted to evade every aggression and every uncertainty decided to enter upon a public career.

But with his tendency to passivity and with his ambition this comes into contradiction. The picture of his father who had attained more in life than he, always came before him. So he imperceptibly reached the conclusion to follow a judicial career. But his habitual attitude required that *he remain unresponsible for his entire future.* Subsequently it becomes evident that his employment tired him, his thoughts digressed and finally compulsive thoughts appeared which hindered him in his work but which, however, contained his latent but powerful ideas of greatness. In his phantasie he constructed the idea of "a higher power" with which he would hold dialogues and which he could place in his service. That is to say, he cultivated the motion of being stronger than any known power and this by means of some secret charm. The triumph and excitability because of which he made himself happy could come, to be sure, only from an extraordinary condition of over-valuation. This play would occur somewhat in the following way: if he had to conclude a calculation the thought would enter his mind that perhaps his mother would die if he were not finished by a certain time. Accordingly he would call upon the "higher power" to which he would offer half of the smoked cigarette as a bribe and then he could continue his work in peace. In this way he came to regard the continued life of his mother as due to his own will and deed. By this compulsion neurosis a great deal of time was idled away; that is certain. But was not "time" the greatest danger for this young man who felt himself, as a result of his life's capacity, bound down to passivity? And is not this the exact line which lead to homosexuality only that he did not have to be on guard against woman?

Considered psychologically his homosexuality and his compulsion neurosis were of equal value; both were artifices, enchantments. The patient was seeking after triumph but he could not trust himself to go about it in a normally aggressive way. It is self-understood that his beginning studies have had something to do with his compulsion neurosis but he beheld the imagery of a godly superiority over everyone which could not be expressed or favored by an "hereditary" or diseased trifle.

The symptom-complex gives us the impression of paranoia and of dementia praecox with which homosexuality in many points borders. We distinctly see the impulsive factor in the tendency to evade by his own uncertainty the expectations and demands of society and by the legitimation of the disease or by emphasizing its hereditary side to strike off his responsibility, in the event that the self-demanded superiority is not attained.*

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The time of the appearance of his compulsion-neurosis gives us new confirmation of the correctness of our comprehension. One year before our patient had had homosexual relations with a friend and later he had connection with a girl. He found this condition so humiliating that he abandoned it entirely. Soon afterwards his ambition found compensation in the imagination of "a higher power" which was subjected to him. In this state of helplessness he came under my treatment unshaken in his belief that his homosexuality was unalterable. It could be easily seen that his visit to me did not spring from a desire to rid himself of the homosexuality but as an attempt to become convinced of the fruitlessness of treatment so that he could justify a relapse to his perversive relations. We can understand what new and increased difficulties towards treatment grow out of this not unusual grouping.

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*Adler. "*Das Problem der Distanz*" *und* "*Verantwortlichkeit in der Neurose und Psychose,*" *Zeitschrift f. Individualpsychologie, Heft I and II*, 1914.

But not alone was the inclination to forgive his friend soon revealed. We came upon a condition which in the highest degree warranted him to be forgiving. For some time there lived in the same house with him a distant female relation who looked upon his homosexuality as dangerous, or liable to become so. The fact that she was a relation and thereby stood closer to him and because of her sympathy for him, he was forced to draw away from her all the more. In order to bring her conduct into harmony with his *Lebensplan, i. e.*, in order to frustrate her he had to fall back upon his trustworthy method of "hardening measures." He often would apply all sorts of tests to himself to determine if he could counteract and stay the girl's charm. And he always succeeded in thus safeguarding himself. All this proof does not influence us at all; he was a corrupted manager. And we find a strikingly powerful indication in the following curious phenomenon: if a suitor appeared and began courting the girl then our patient overcame his feeling which he described as being similar to jealousy. And he did not rest until, by means of sharp criticism or all sorts of small intrigues, he succeeded in discouraging the suitor stark cold. If, on the other hand, the girl remained without a suitor for any length of time he would think out various plans how to marry her off quickest. We see his old play that he always arranged even in his employment. For every step forwards brought him nearer to a decision but his whole plan of life was, however, to avoid every test because he had lost confidence in himself.

As his relative again remained for a longer time without a suitor and fastened herself somewhat closer to him he went a step further to safeguard himself and confessed to her that he was homosexual. This confession, however, did not make the desired impression upon the girl. In fact, she tried to draw him even closer in order to save him—a frequently encountered girlish phantasie.

He now began to see the unfaithfulness of his friend in a mild light but he tried to draw him closer in order to escape from the intimacy of the girl.

He came to me in the full expectation that I would confirm his own opinion of the unalterability of the perversion about which he had read in the works of well-known authors. After some time I was able to state a contrary view. I subsequently succeeded in breaking him off from his homosexuality, but for two years I waited in vain for any change to the normal in his relations to women. The whole progress that I was able to obtain in this patient, although he interrupted the treatment often against my will, consisted, as the patient told me purposely two years later, that he entered into masturbation and occasional masochistic practices with prostitutes. He wanted to prove that he was still unsuited to woman. With his studies also he is very much behind. His compulsive thoughts, however, have disappeared, but in their place he seeks his distance to life by a paroxysmal somnolency just as soon as he begins to study.

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I do not believe that I could be accused of embellishments. In future I hope to obtain better results. It is always a great satisfaction to me to have advanced the view of specialists on the nature of the perversion as an artifice, as a badly selected but ingeniously prepared method of life, expended in ambition but which power does not restore and which has to reckon with the demands of society. With this assertion I wish to say at the same time that homosexuality is to be added to the neuroses and considered in the same category.

HEAVENLY BRIDEGROOMS.

By

THEODORE AND IDA C. SCHROEDER.

(Continued from May, 1917.)

EARLY in the 17th century, a light dawned upon the horizon of these illusions and diableries. That light was the manifesto of a secret society of mystics called the Rosicrucians or followers of the Rosie Cross. In 1603, the sect became known; in 1623 it placarded Paris with mysterious announcements; but it professed to have existed long before. Who its members were, whether the society really existed, or whether the whole affair was a joke on the mystics, are questions which today remain still unsettled. But, whether a reality or a myth, the Rosicrucians were a factor in the literature and mysticism of their time, and a secret society of the same name still exists. They dealt a powerful blow at the superstition which assumed the spirit bridegroom and the spirit bride to be diabolical.

"They discarded forever all the old tales of sorcery and witchcraft and communion with the devil. They said there were no such horrid, unnatural and disgusting beings as the incubi and succubi and the innumerable grotesque imps that men had believed in for so many ages. Man was not surrounded with enemies like these, but with myriads of beautiful and beneficent beings, etc.—all anxious to do him services. The sylphs of the air, the undines of the water, the gnomes of the Earth, and the salamanders of the fire were men's friends, and desired nothing so much as that men should purge themselves of all uncleanness, and thus be enabled to see and converse with them. They possessed great power, and were unrestrained by the barriers of space or the obstructions of matter. But man was in one respect their superior. He had an immortal soul, and they had not. They might, however, become sharers in man's immortality if they could inspire one of that race with the passion of love towards them. Hence it was the constant endeavor of the female spirits to captivate the admiration of men, and of the male gnomes, sylphs, salamanders and undines to be beloved by a woman. The object of this passion, in returning their love, imparted a portion of that celestial fire, the soul; and from that time forth the beloved became equals to the lover, and both when their allotted course was run, entered together into the mansions of felicity. These spirits, they said, watched constantly over mankind by night and day. Dreams, omens, and presentiments were all their work, and the means by which they gave warning of the approach of danger. But though so well inclined to befriend man for their own sake, the want of a soul rendered them at times capricious and revengeful; they took offence at slight causes, and heaped injuries instead of benefits on the heads of those who extinguished the light of reason that was in them by gluttony, debauchery, and other appetites of the body." (*Mackay's Popular Delusions.*) *Mys-*

teries of the Rosie Cross, by A. Reader, Orange Street, Red Lion Square, London, 1891.

There is a book called *Sub Mundanes*, which in a vein of delicate humor deals with this belief of the Rosicrucians. It purports to be written by an acquaintance of one Count de Gabulis. It was published by the Abbot de Villars, nephew of Montfaucon, in 1670. Sub Mundanes refers to stories told of the Gothic Kings being born from a bear, and a princess of Pegusians being born from a dog and a woman; of a Portuguese woman, who was exposed on a deserted island having children by a large monkey. The author goes on to say that the sylphs of the Rosicrucians, seeing that they are taken for Demons when they appear, in order to diminish aversion, take the form of these animals, and accommodate themselves thus to the whimsical (bigearre) weakness of women, who would be horrified at the sight of a handsome sylphe, but less so at a dog or monkey.

Sub Mundanes tells a story of a hard-hearted Spanish beauty who repulsed a Castillian gentleman so effectually that he left her and set off to travel to forget her; a sylph fell in love with her, took the shape of her absent lover, wooed her persistently and won her. A son was born; and when she was again enceinte, the earthly lover returned to Seville, quite cured of his passion, and hastened to call on her, saying he should now displease her no longer, as he had ceased to love her. Result: a scene, tears, reproaches on the part of the young woman; parents come in and the whole matter is brought to light. The writer continues:

"And what part played the Airy-Lover (interrupted I) all this while? I see well enough (answered the Count) that you are displeased that he should forsake his mistress, leaving her to the Rigour of the parents and to the Fury of the Inquisitors. But he had reason to complain of her: She was not devout enough: for when these gentlemen immortalize themselves they work seriously, and live very holily; that they lose not the Right which they came to acquire of Sovereign good: So they would have the person to whom they are allied, live with exemplary innocence."

Sub Mundanes also tells of a young Lord of Bavaria * * * * who was not to be comforted for the death of his wife: Whereupon a Sylph took her shape. The same story, as told elsewhere, however, stated that it was his own wife who returned from beyond the grave. They lived together many years, and had children. But he "swore, and spoke lewd, uncivil words." She reproved him vainly, and at last "she vanished one day from him, and left him nothing but her Clothes, and the Repentance of his not having followed her Holy Counsels. Monsieur Bayle informs us that the "Count de Gavalis" was published at Paris by the celebrated Abbott de Villars (nephew of De Montfaucon) in the year 1670.

These two stories show what stress is laid by the spirit lover upon the necessity for the earthly psychic to keep the moral law.

Another story, unreal and fantastic as is the catastrophe, shows that bigamy is not condoned on the Borderland, and that no man can serve two mistresses without punishment, when one of the earthly partners of one of these nymphs is his Borderland spouse. It appears that he "was so dishonest a Man as to fall in Love with a Woman; but as he Dined with his new Mistress, and certain of his Friends, there was seen in the Air the Loveliest Creature of the World; which was the invisible Lover, that had a mind to let herself be seen by the Friends of her unfaithful Gallant; that they might Judge how little reason he could have to prefer a Woman before her. After which the enraged nymph struck him dead immediately. (Sub Mundanes.)

But popular prejudice regarding the reality of witchcraft died hard. The Rosicrucians were charged with doing as did the witches—projecting their astral forms for selfish and lawless purposes. It was believed by the populace, and by many others whose education should have taught them better, that * * * * gentle maidens, who went to bed alone, often awoke in the night and found men * * * * of shape more beautiful than the Grecian Apollo, who immediately became invisible when an alarm was raised. (Mackay's En. Pop. Delusion.)

But this seems rather unlikely, when we carefully consider the following pronunciamento with which they placarded Paris.

"We, the deputies of the principal College of the brethren of the Rose-cross have taken our abode, visible and invisible, in this city by the grace of the Most High towards whom are turned the hearts of the just. We shew and teach without books or signs, and speak all sorts of languages in the countries where we dwell, to draw mankind, our fellows, from error and from death."

Moreover, the Rosicrucians maintained most positively that the very first vow they took was one of chastity, and that any of them violating that oath, would be deprived at once of all the advantages he possessed, and be subject to hunger, thirst, sorrow, disease and death like other men. Witchcraft and sorcery they also most warmly repudiated." (Mysteries of the Rosie Cross, by A. Reader.)

And the editor of Sub-Mundanes, in a footnote, refers to the Rosicrucian marriage with the elementary or Spirit-life, esteemed a duty by the sages and cultivated with fasting, watching, prayer and contemplation and acquiring thereby that condition of spiritual repose, only in which inspired visions occurred.

Why did these mystics call themselves *Rosicrucian?* Some writers have attempted to derive the name from two words meaning "dew" and "cross": but the usual interpretation is "followers of the Rosy Cross"—a cross with a rose being used as the society's symbol. Some derive the word from the names Christian Rosenkrenz, the reputed founder of the society; but in view of the fact that it is uncertain that he ever lived, and that the stories told about the opening of his tomb 120 years after his death, have a decidedly mythical flavor, one may be pardoned for considering this personage a myth, invented as a convenient explanation to outsiders to throw them off the track of the real meaning of the society's name.

Now, the cross is an old, old religious symbol of the union of man and woman the world over and dates from an unknown antiquity. The rose is a well-known symbol of love under its most ardent form. We have already seen that the Mexican Virgin, Sochiquetzal, was presented by a heavenly messenger with a rose when the annunciation was made that she should bear a mysteriously begotten son; that her name means the "lifting up of roses"; and that this event marks the commencement of an epoch called "the age of Roses." We have seen that the Mexican Eve sinned by plucking roses which elsewhere are called, apparently, "the fruit of the tree." We have seen that quite on the other side of the world among the Mohammedans, is found a tradition that Christ was conceived by the smelling of a rose, and there is an Eastern legend that the burning bush in which the angel of the Lord appeared to Moses—a bush which burned without being consumed—was a rose bush. May not these roses be symbolically one and the same with the rose upon the Rosicrucian cross? If so, remembering the Rosicrucian teachings about the duty of chastity, the joy of nuptials with a being from the unseen world, and the obligation to enter upon that heavenly marriage with "fasting, watching, prayer, and contemplation," we may well believe that they had learned the inner mystery of aspiring through passion to communion with God and of placing the rose of Divine Love upon the cross of marriage union in Borderland wedlock.

Altho' in a book entitled "In the Pronaos of the temple of Wisdom," by Franz Hartmann, occurs a list of Rosicrucian symbols followed by the significant remark: "He who can see the meaning of all these allegories has his eyes open."

Many of these symbols are evidently phallic, and yield easily to the interpretation that they are symbols in the training of the occultist in the three degrees to which I have already referred.

But, despite the good work done by the Rosicrucians in lifting Borderland wedlock to a higher plane in the estimation of the public, it was not all plain sailing yet. The Church—that conservator alike of the useful and the useless things of the past—clung to the old belief of witchcraft days. When one of her mystics—either nun or priest—became thus espoused, the Church seems to have a middle course between the old and the new. Usually she termed such experiences "*Congressus cum daemon*," and bent her powers to exorcising the evil one. But occasionally, as in the case of St. Teresa, the nun was a clear-headed woman of known integrity and purity. "*Congressus cum daemonibus*" was out of the question where such a woman was one of the parties to the union in these instances. But what one can only call an inspiration from on high, the Church promptly decided that the *congressus* was diabolical, but heaven sent. And, since the nun was the professed "bride of Christ," what more natural than that her experience should be viewed as a mystical union with this Divine Bridegroom? In this, the Church acted according to her light, and I think it must be admitted she did fairly well, considering the ignorance and prejudice of the times.

Latin scholars will notice that the laws of Latin syntax require a word to be supplied in translating this phrase—a general term, such as the word "something," or "that which belongs to." As this grammatical construction was used by a very learned Catholic priest when discussing the matter with me, I cannot suppose it to be a slip of the tongue, as I should have supposed, had the speaker been less of a scholar. This construction, however, instead of obscuring, really sets forth the matter with clearer resemblance to the psychic's useful physiological experience, as will be seen by comparing it with the legends I have referred to regarding the finding of the body of Osiris by Isis. Only by comparing this Latin expression with the legends and their application, will this phrase be properly understood.

It is noteworthy, however, that in St. Teresa's case, her confessor, after having her write out a detailed account of her experience, ordered her to burn a great part of it. Was it because the objectivity of her experiences did not harmonize very well with the mystical idea of "espousal to Christ"?

Where the earthly partner in these unions was a woman, and a nun at that, pledged to unfaltering obedience to her official superiors, it was probably an easy matter for her confessor to lump all her experiences—veridical as well as illusory—under one heading, that of subjective. A virgin is usually by reason of her environment as a woman, so ignorant of the physiology of marriage that it is difficult for her as a psychic to distinguish what is real from what is unreal until she has been a Borderland wife for some time. But for the priest to whom the blessed experience of Borderland wedlock came in all its fullness, a different course of treatment must have been necessary, since, being a man, with the opportunities of knowledge open to a man, and to a priestly confessor of sinful men and women, he could not be hoodwinked by his superior into taking for subjective illusions these experiences which were distinctively objective. The records of witchcraft contain accounts of priests who were burned at the stake for a union of this sort extending over forty and fifty years, with a spirit assumed to be the Devil in the form of a Woman.

Pope Gregory, who is known as Hildebrand, that pope who strove so persistently to purge the priesthood of simony and unchastity and to emancipate the Church from interference by the temporal power. But what is done with priests nowadays who enter upon Borderland wedlock, is not, so far as I can learn, revealed to the general public. From a French physician, however, I learn of a custom among the Continental priests concerning their sleeping arrangements which suggest that more allowance is made nowadays than formerly for those whom Heaven has thus singled out, and that the Church bows to the will of Heaven in this matter, and lays no blame upon the priest.

Theophile Gautier has written a novelette called Clarimonde, which recounts the love of a beautiful vampire for a priest. She comes to him each night and they mount and gallop away to her palace, whence he returns at daybreak for his priesthood duties. The author represents the priest as struggling between his duties as a priest and what he considers the allurements of sin; and in consonance with the idea, that punishment is visited upon the sinner. Gautier reveals her as a vampire sucking the blood of her lover while he sleeps.

It would seem as though the author, especially for a priest of God, were catering to the popular superstition that it is sinful to enjoy sensuous love. But if anyone in the world is entitled to the joys of true Borderland wedlock, it is surely a priest who has kept his vows of asceticism, and who is really pure-minded. If anyone in the world needs it, it is surely the priest who is supposed to stand midway as a bridge-builder between earthly sinners and celestial beings of the unseen world beyond the grave, since it is pretty generally acknowledged that well ordered sex life is necessary to the development of a symmetrical character. For what mean the words "holy" and "holiness"? They mean "whole-ly," "wholeness." The man and woman who expects to be indeed "holy," must be "whole," *i. e.*, symmetrical. In old Testament times, Jehovah forbade any priest who was a eunuch to minister before Him, thus recognizing the importance of sex in the perfect man. The Rev. Arthur Devine, Passionist, in a book entitled "*Convent Life, or the Duties of Sisters Dedicated in Religion to the Service of God*"—a book which the title-page shows is "intended chiefly for superiors and confessors"—takes up the subject of nuns who are subject to visions and supernatural revelations. Considering the question as to whether such experiences are true visions or the results of deception and error, he mentions as one test the consideration of "Whether it (the revelation) contains anything false, because in this case it cannot proceed from the spirit of truth: Therefore, it is necessary to consider whether it is confirmable to Scripture, to faith and morals, to theology and to the doctrine and traditions of the Church. * * * * Are they (these communications) accompanied by the cross and by mortification, and do they tend to the manifestation of the faith and the utility of the Church?" From which it will be seen that a heavenly bridegroom who is not a good Catholic has every prospect of being classed as demoniacal, if he happens to have the same religious belief as herself. This is a case where religious prejudice furnishes the standard by which to test the communication, and it will be remembered, to start with, that any subject, when dealing with occult phenomena, is certain to bring about occurrences of a fantastic, misleading or diabolical character.

The spiritus percutiens, "rapping spirit" (?), conjured away by old Catholic formulae at the benediction of churches, was brought forward by some of M. de Gasparin's critics. As his tables did not rap, he had nothing to do with the *spiritus percutiens,* who proves, however, that the church was acquainted with raps, and explained them by the spiritualistic hypothesis.

A learned priest has kindly looked for the alleged *spiritus percutiens* in dedicatory and other ecclesiastical formulae. He only finds it in benedictions of bridal chambers, and thinks it refers to the slaying spirit in the Book of Tobit. (Andrew Lange, *Cock Lane and Common Sense*, pp. 316-317.)

The "slaying spirit" in the Book of Tobit, it will be remembered, was a so-called evil spirit who was in love with Sara and who objected to her marrying, and who slew seven successive earthly aspirants to her hand on the bridal night of each. He is always referred to as an instance of the incubus. But let us not forget that so-called incubi are angels, and are never evil; since in order to hold communication with the beloved earthly person, they, as well as the psychic, are obliged to live correctly and think clearly. And what is evil on the Borderland is all subjective and never objective. And the number seven, too, in regard to the husbands of a virgin who already has a spouse, has a suspiciously mythical, folklorish look.

That the Roman Catholic Church should take account of such a spirit in the benedictions of bridal chambers shows that it has had good reason to suspect the visits of incubi to the virgins of its laity, as well as to the virgins of its nunneries. Indeed, Tylor in his *Primitive Culture* tells us that the frequency of incubi and succubae "is set forth in the Bull of Pope Innocent VIII., in 1484, as an accepted accusation against "Many persons of both sexes, forgetful of their own salvation, and falling away from the Catholic faith."

The following, which I take from Sub Mundanes, refers to one of the most noted instances in convent life of an incubus who was objectively as well as subjectively the spouse of a nun. "A little Gnome got into the affections of the Famous Magdalen of the Cross, Abbess of a Monastery at Cordova in Spain; she made him Happy, when she was but twelve years old; and they continued their *Amours Libres* for the space of thirty years; until an ignorant Director persuaded Magdalen that her Lover was a Fiend; and forced her to demand absolution of Pope Paul the Third. Yet it is impossible that this could be a Demon; for all Europe knew, and Cassidorus Reniris has made known to all Posterity, the great miracles which daily were wrought in Favor of this Holy Woman; which certainly had never come to pass, if her *Amours Libres* with the *Gnome* had fallen so Diabolick, as the Venerable Director imagined." (Sub Mundanes.)

Another account, however, informs us that the abbess was accused by her nuns of magic—"a very convenient accusation in those days when a superior was at all troublesome"—and that she very cleverly anticipated them by going to the Pope to confess all and throw herself on his mercy. Inasmuch as he granted her absolution, one cannot help wondering if he did not read between the lines of this confession the occult truth and recognize her as a lawful Borderland spouse. Most of the accounts state that Magdalen's lover was the Devil, who appeared to her as a black man. Here we come upon the same root idea, doubtless, as that behind the black Madonnas, the black Krishna and the black Quetzalcoot of Mexico, a symbolism due perhaps in part to the darkness of the unknown world whence they emerge, and in part to their folklore and occult aspect as deities of nighttime and Borderland nuptials. "I am black, but comely," says one of the lovers in that mystical and passionate Song of Solomon.

I have already referred to the Song of Solomon as being interpreted by Christian comment and said to be a poetical statement of the rapturous union between Christ and his Bride, the Church. A sidelight is thrown upon the interpretation by a note in Kitto's illustrated Bible, which quotes Lane (Modern Egyptians) as saying that the odes sung by Mohammedans at religious festivals were of a similar nature with the Song of Solomon, generally alluding to the Prophet as the object of love and praise. In the small collection of poems sung at Zikrs, it appears, is one ending with these lines:

"The phantom of thy form visited me in my slumber; I said: 'O phantom of slumber! who sent thee?'

He said: 'He sent me whom thou Knowest:
He whose love occupies thee.
The beloved of my heart visited me in the darkness of night
I stood to show him honor, until he sat down,
I said, 'O, thou my petition and all my desire!
Hast thou come at midnight, and not feared the watchmen?'
He said to me, 'I feared; but, however, love
Had taken from me my soul and my breath.' "

"Finding that songs of this description are exceedingly numerous, and almost the only poems sung at Zikrs; that they are composed for that purpose and intended only to have a spiritual sense (though certainly not understood in that sense by the generality of the vulgar): I cannot entertain any doubt as to the design of Solomon's Song."

This religious mysticism finds a modern echo in a little publication recently issued by the Adi Brahma Samâj of Calcutta, as the first step in a new propaganda. It is entitled "*The Religion of Love.*" In its pages occur these words:

"Though these terms, Father, Mother, Friend, Husband of the soul, are allegorical, they very aptly express our sweet relationship with God, and we have every right to use them. Among these allegorical designations the Husband of the Soul is the best."

Zanchius wrote an "*Excellent Trait du Mariage Spirituel Entre Jesus Christ et son E'glise,*" in which he drew a close parallel between earthly wedlock and the spiritual and divine marriage of Christ with the Church Universal. Among other things he laid stress on that scriptural saying of earthly husband and wife, that the twain shall become one flesh; and he said that, according to Scripture, it was neither God the Father nor God the Spirit who is Sponsor of the Church, but the Son, who was made of like nature with ourselves—like in all things to us, but without sin. He added:

"His soul does not pervade all space, because it went out of his body when he died and consequently was not in all places, since going out of the body, it did not remain therein, afterwards being returned to the body and never was and never will be (any more than the body) in all places. * * * *

"In this spiritual marriage, all the person of each faithful one—that is to say, the body and the soul—is conjoined with all the person of Jesus Christ, and is made one flesh and one person with him."

As to the method by which this combined fleshly and spiritual union of the Christian with Christ can take place Zanchius seemed to think that the Eucharist in which one partakes of the body and blood of Christ, is the sole appointed means.

Now the Eucharist, or the use of bread and wine in a sacred rite, was as old Pagan custom bound up with the idea of entering into blood brotherhood of which Jesus made use to emphasize his own brotherhood with his disciples. The ceremony of the Eucharist was found in Peru when the Jesuits first landed. In fact, it is a very, very ancient rite existing in widely separated countries. The Christian writer, Arnobius, rebukes in cutting terms the Pagan mock modesty which blushed at the mere mention of "bread and wine"—a matter which indicates some folklore connection between the Eucharist and sex; and if so, then between the Eucharist and the ancient mysteries of Phallicism. Inasmuch as by far greater part of all that was pure and holy in Phallicism is bound up with Borderland wedlock, it is possible that the Eucharst may have esoterically a wider significance than either Arnobius or Zanchius was aware.

Modern believers in the union with Christ have taken a less mystical and more practical view of it than did Zanchius. Mrs. M. Baxter of the well-known institution for Divine Healing, Bethleham, London, has issued a little pamphlet on that text of Ist Corinthians VI. 13, "The body * * * * for the Lord, and the Lord for the body." In it she says:

"One of the most successful devices of Satan has been his attempt to divorce our bodies from our souls in their relation to God. 'Your soul is the Lord's, of course, but your body is your own. You must serve the Lord with your soul, but enjoy yourself with your body!' Such is his counsel to those whose tendency is gross and carnal, such as easily become drunkards, fornicators, or prostitutes, and form the large class of fallen men and fallen women in our midst. To another class he comes and says, 'You are religious; but it is your soul with which you can serve God; all you can do with your body is to punish it, and destroy it by slow degrees.' Many look upon this as religious heroism; but it is as much a lie to the truth of God, as is the grosser misuse of the body for lust or appetite. God comes with his glorious claim, 'the body is for the Lord, and the Lord for the body." (Mrs. M. Baxter.)

Under the Divine Touch, a pamphlet written by Chester E. Pond of Philadelphia, contains the following recorded experiences, which, mystical as they may be considered from one standpoint, are singularly suggestive of the earlier experiences of the psychic who has entered on Borderland wedlock, but who has not yet learned to distinguish between subjective and objective touches—that is, between a touch which is material, tangible, real, and one that is only an hypnotic suggestion made by the Borderland spouse.

"For the last eleven months, my whole being has been open more or less to the joys, delights and peculiar sensations of heaven. Recently the Lord has been giving me his choicest foretastes of heavenly blessedness just before I arise in the morning. During these eleven months I have been daily and almost hourly conscious of His positive and holy touch in some part of my natural body. But during these recent morning experiences His touch has been more sweet and more powerful than usual. These heavenly experiences, when viewed from a human standpoint, seem remarkable. But when viewed from a heavenly standpoint, they seem perfectly natural. They have come to me very gradually. In every way they have been orderly and helpful. They seem just what might be expected to come to any devout Christian. For the Lord is no respecter of persons. In considering thes experiences it should be borne in mind that Jehovah Jesus is in every way infinite, that He never makes two things just alike in the natural world, and that He never acts twice alike in the spiritual world. Hence, as might be expected, He touches my 'natural body' through my 'spiritual body' in an infinite variety of ways, and with infinite sweetness. But for convenience I will classify and say that He touches me, *first,* directly or immediately; *secondly,* He touches me through the medium or ministration of angels; and, *thirdly,* through the medium of His Written Word. * * * *

"To my distinct consciousness the spirit of the Lord is that living divine, or divine substance which constantly proceeds from His divine person, somewhat in the same way and manner that rays of light and heat are continually proceeding from our natural sun. It is written that 'God is love,' and that 'God is light,' or truth. From this we learn that love and truth constitute the divine essence. And in the ordinary use of language, heat corresponds to love and light to truth. We call a loving person warm-hearted, and an educated person enlightened. Jesus Himself taught spiritual truths by natural symbols * * * *

"The Lord, in His mercy, tempers the inflowing of His spirit to our different states of receptivity. * * * * If He had poured His divine love and truth into my soul and body one year ago, with the same degree of heat and power that He does now, I believe I should have ben consumed.

"My experiences are endless in variety. At times, when love seems to predominate over truth, the divine proceeding that streams forth upon me appears to my spiritual vision like the golden beams of an autumn sunset, but when truth predominates over love, they appear like streams of white light reflected from burnished silver.

"At times I am consciously alone with the Lord. At other times I am consciously in the presence of angels. Since these touches of the Lord are infinite in variety, I can never tell one minute what will occur the next. As I now sit writing I am so literally full that every particle of flesh in my body feels as if it were alive and moving. This extreme fullness in the daytime does not occur every day. It will probably not continue more than eight or ten hours. While I am busy it is not excessively delightful. But if I were to lean back in my chair, or to go and lie down, I should soon be completely deluged with floods of heavenly glory, and be 'lost in wonder, love and praise.' The movings of the spirit are usually undulatory. When I am still, and sometimes when at work, they come like waves of liquid sweetness, and roll over me and through me in every conceivable direction, and with all conceivable variety.

"Occasionally at night the Lord touches me all over alike for a few seconds. At such times I seem to be literally resting *in* and *on* the Divine. Sometimes He touches only a few fibres in some very small muscle, and through these He fills and thrills my whole being with unutterable divine glory. At times His holy touch is very delicate, tender and meltingly sweet. At other times He touches me with a power that moves the very foundations of my being, and that seems almost startling. Sometimes He moves very slowly, at other times so rapidly that it seems as if the next wave of glory would loosen my 'spiritual body' from its present moorings in the 'natural body.' A few mornings ago while lying in bed under a divine influx that filled me with divine love and sweetness to the very utmost extent of my present capacity, I could but exclaim, 'O Jesus, my dear heavenly Father! Thou alone art infinitely wise and infinitely holy! In Thy presence I am nothing, I am nothing! Before Thee I know nothing, I know nothing These sweet touches of Thy spirit, these indescribable sensations, these angelic delights, these ineffable thrills of divine glory I cannot understand! I can now understand them no better than if I were a new-born infant lying at Thy feet! Such knowledge is too wonderful for me; it is high, I cannot attain unto it! Dear heavenly Father, I can no more understand how each divine touch can fill me with such holy sweetness and with such transports of joy, than I can understand how Thou canst create a world! O Thou Eternal Word, by whom the worlds were framed! I can no more comprehend Thy present movings within my own little body, than I could have comprehended the ancient movings of Thy spirit upon the face of the great deep if I had been present when Thou didst say, 'Let there be light, and there was light.' * * * *

"Through the loving touch and conscious presence of an angel, be it a man or a woman, the Lord can fill me with celestial delights and sensations that are similar and almost equal to those produced by the direct inflowing of His own holy spirit. The difference between the two is easily discernible, but not easily described. Both are immeasurably superior to any soul or bodily delight we ever experience in the ordinary planes of Christian life. As near as I can describe it the difference between the two is this. When waves of glory are produced by the direct touch of the Divine Spirit they seem to have, as it were, a golden tinge, a delicate crest of holy sweetness, which does not accompany those produced through the touch of an angel. * * * *

"The angels are so thoroughly honest, so perfectly free from all false modesty and pretended humility, and are so free from all formality and human ceremonies, that the presence of an angel is always elevating and refreshing. * * * *

"The Lord touches me consciously now through the medium of His Written Word * * * *

When I read the Scriptures my whole 'spiritual body' can feel the touch and power of the Living Divine that flows through its words and sentences, just as plainly and unmistakably as my natural body can feel the touch and force of the wind. And at times the 'Spirit of Truth' flows all through me, and all over me, so forcibly that I feel as if I were literally 'in the Truth.' At these times the Eternal Word shines through the Written Word with such illuminating power that various human theories and speculations are scattered to the four winds. And under such illumination 'it is given to know the mysteries of the Kingdom of God.' * * * * I can learn more in one hour under such practical tuition than I ever learned in a whole year at Yale Theological Seminary. In religion theories have their uses, but the school of experience is the only school that can be relied upon for instruction in the mysteries and deep things of God. It often seems to me as if the Christian world, ministers included, were looking more to their creeds, and to one another, for their theology, than to the Word and the Spirit. * * * *

"Before anyone can become personally acquainted with the Lord, and with the true meaning of His written Word, he must necessarily forsake every known sin and he must know what it means to live up to every known requirement and privilege of the Gospel. He must also ask for and receive a tender conscience, an enlightened reason, and a sanctified common sense. Then he will no longer be afraid to use his own reason and his own good sense. I have recently received from the Lord, as I believe, the following unsectarian motto:

" '*Love everybody, learn of everybody, and follow nobody but the Lord Jesus Christ.*'

"To obtain and retain constant Divine guidance and tuition I find that my higher nature must bear complete and easy sway over my lower nature; that the 'old man' must be wholly put off and the 'new man' wholly 'put on'; that the affections and thoughts of my 'inward man' must have easy and complete control over every appetite, passion, and desire of my 'outward man'; and that I must keep myself so full of the Lord, that I can live 'a heavenly life upon earth,' in all places and under all conceivable circumstances, just as easily and naturally as I can breathe the sweet air of heaven. * * * *

"This loving and indescribable union with God, is no longer a mere matter of faith with me, but it is a matter of actual knowledge and sweet experience. * * * *

"While enjoying these heavenly experiences the Lord has given me better health than during any eleven months for the last twenty years. And He has dealt more tenderly with me than any human mother ever dealt with a helpless infant. * * * *

"I sincerely hope that the love and goodness of the Lord, so bountifully manifested in giving me such large foretastes of heaven while yet in the body, will prove helpful and encouraging to every honest-hearted reader. But since the ways of the Lord are infinite in variety let no one look for an experience precisely like mine. I have prayed for years that the Lord would make me just as pure, just as holy and just as useful as lay within the scope of human and Divine possibilities. He is now taking His own way to answer my prayers." (*Under the Divine Touch, by Chester E. Pond,* No. 1432 Chestnut St., Philadelphia, Pa. First published in the Mount Joy *Herald*, Mt. Joy, Pa., under dates of April 8 and 15, 1882.)

In the following experience, it will be seen that this so-called Divine touch, reveals itself as that of a Borderland bridegroom. It is taken from a letter written by a lady, a devout and pure-minded Christian, as will be noticed. Her experiences occurred at a well-known summer resort in the United States where a cottage for divine healing had been established. But as the letter was shown to me by a third party, I do not feel at liberty to mention the town, lest some clue be given to the writer's personality. Indeed, it was only on this condition that the person who showed me this letter allowed me to make use of it herewith.

"Dear Sister . . . .—Since learning from Miss . . . . . . that you know the experience which is mine, I have thought I should write you.

"At first, as the newly married Bride, I shrank from exposing the secrets of my *Love*. They were secred between my Beloved and myself. Now, it has shown me that this wondrous truth, as well as all other truth, must be acknowledged, and that a most glorious part of my high calling is to cooperate with Him in calling His Bride unto Himself. * * * *

"For myself, I had not time to question; the truth was sprung upon me unexpectedly, and I just went under. The fears and questionings came afterwards; but blessed be my God! He did not let me parley long with the foe, but Himself strengthened me to shake off his power, and, coming fully under the shelter of *His love*, press on—until He has fully established me, and I, impelled by His mighty Spirit within me, reach eagerly forward to the glorious unfoldings of *His love* and *power* that lie beyond. * * * *

"Suffice it to say, I am in great and abundant fullness and blessing, alike in my physical and in my spiritual nature, and that His own abounding life flows *in power* through my whole being. * * * *

"I would have * * * * *fully understood* that this is the fulfilment of the marriage relation between Christ and the body—that as he has been recognized in the soul as Lord over it, and also over the other parts and organs of the body, so now must He be recognized and accepted in the organs of generation as Lord over them; and *His life* must be allowed to come in, where, through fear of evil, the motions of life have heretofore been suppressed. Satan is bound to beset the soul with fears, it may be the most terrible, and to whisper, perhaps dreadful things. The only way is to remember the faithfulness of Him who has led us these many years—*never* betraying our *confidence*. Standing upon the written word, and casting ourselves in complete abandonment upon Him, let Him have His way in every part. The life abundant must flow into every part of His *purchased possession*, ere we are *fully* redeemed.

"Inasmuch as we withhold from Him one part or organ, we are robbing God of just this much. God has given us no idle words in his written Word; *EVERY PROMISE* is to be realized by us, as we follow on, and enter into the experience portrayed in each particular position of the word. * * * *

" 'The Body, the Temple of God.' I. Thess. IV. 3, 4; I. Cor. III. 16-19;

" 'The Living Sacrifice.' Rom. VI. II. 12, 13; VIII. 10-13; Rom. XII. I;

" 'The Bride and Husband.' Isaiah XXVI. 9; LIV. 5; Cant. III. I.; Eph. V. 29-32; 22, 23; 2 Cor. XI. 2; I. Cor. XII. 21-23; Col. I. 25-27; Ezek. XXVI. 25; Hos. II. 14-16; John XXVII. 23; Hos. XIX. 20; Hos. VI. 3; Rev. XIX. 7-9; Rev. ch. XXI.; Ezek. ch. XIII., to end.

"The Song of Solomon was not to be a dead letter but meant by the Holy Ghost to be the experience of the *Bride of Christ*. I find God now in wondrous reality in His written Word. The meaning, hitherto unknown, of different passages, stands out clear and distinct—and the Living Word within me, throbbing and thrilling and permeating my whole being with His glorious Presence, bears witness of the written truth. * * * *

"One day, I read in the Word, being led to it, the assurance of the angel concerning Mary. Perhaps that day—or very soon after—the Spirit brought to me, as I was preparing dinner—'Fear not, that which is conceived within thee is of the Holy Spirit.' Such a rapid and powerful witness to the Word went through and through me, beginning at the organs of generation, going all through, that I was in great weakness, physically. The tempter had been busy about this time, casting fear upon me lest the flesh were in the matter. Thus the Spirit gave him answer—with the revelation came the thought, 'I am with child!'—but so sure was the witness, that instead of being greatly alarmed—*praise* the Blessed One, a great joy welled up within me at the thought of such a possibility.

"A *glorious victory*, afterwards. He showed me that it meant that this precious truth of the marriage relation between us was, 'that which was in me was of the Holy Ghost.' *Praise the Lord!* He has made me willing to do—to bear—to suffer anything for Him. He is making me fearless and filling me with His own desire for the spread of *all* His *truth*—though I feel more especially the desire to win souls for Him. I am assured that this, His most glorious and satisfying revelation of Himself, *must* be acknowledged as He shall call upon us to do so, or we shall come into darkness indeed, and distress. Shall the chosen and honored wife shame to confess her husband when he would *woo* others, through her, to the same high place?

"When we enter into this union, He is, as never before, the Life within us, and how shall we seek to suppress the Life that has entered in to displace our own old self-life, and to manifest Himself in and through us, in *whatever way He wills.* He must be permitted to speak through us—and as I constantly pray, to *love, through me.* Oh! with us there must be no question but one, viz.: 'What wilt Thou, my Beloved?'—and ready response, opening up to meet His blessed will. 'As Thou wilt'—'no longer I, but *Christ.*' No more *my* will, in the slightest particular, but the adorable will of my Beloved.

"Reading Madam Guyon in 'Spiritual Progress,' Part II., on 'Union with God,' I find the experience into which I have entered. * * * *

"We have, in these last days, by the * * * * been realizing, as we did in the earlier days, the Presence and power of Him whom we *love.* God comes upon us as we meet together from 6 to 7 o'clock in the morning, to wait in silence before Him—at the table, before and after meals; as we partake of the food He gives. We meet Him in our rooms, and bow down before Him. As I go about my work, ofttimes, His Presence so fills me—or I hear the sweet wooing of His voice, until I am constrained to step aside, where I may—to be *alone* with my *Love*, and fall at His feet in adoring worship. * * * *

"One asks, how is this Baptism obtained? In the *same way* exactly that all other of His gifts are—if we are in the condition to receive them, that is, by faith. He says, 'Thy Maker is thy husband,' and 'in that day thou shalt call me—Ishi. * * * *

"I would say, whatever you do, do not question, lest distress and perplexity come in; but immediately go to Jesus, accepting Him as Ishi—with the words I have given—'be it unto me as Thou wilt.' He will do the teaching afterwards. Then, again, lest one should make of it too scriptural a truth, separating it entirely from the physical, it should be plainly understood that the *union* is as the sexual intercourse of husband and wife.

"If we expect this when the sensation comes, we will not be alarmed, but willingly and freely give those parts of our Divine Husband as the *Bride* would naturally do.

"I have written very plainly, because, first, I *know* it is the way *He* would have me write; and secondly, because I would seek to save from distress and fear, that would harass, if the whole truth is not understood, viz.: If one looks for one kind of manifestation (spiritual), and finds physical and animal.

"Let me hear from you both, when the Lord leads.

"Lovingly in Him, ..."

The same friend who showed me the above letter, also showed me letters from a gentleman who is the editor of a religious newspaper, giving a similar experience, upon several occasions in his life but with more circumstance of detail. Nevertheless, he regarded it as entirely a union with Christ, the Bridegroom of the Soul, and spoke of it reverently.

Madam de Guyon has left us memoirs of her rapturous union with the Divine Bridegroom of the Soul, and verses concerning His love and watchful tenderness which are rare specimens of pure and delicate sentiment. Yet, so little was Borderland wedlock understood by the learned of those days, that Bossuet made a coarse joke about her marriage with the Child Jesus; and another French bishop says Arthur Little wrote what might almost be called an episcopal lampoon. One couplet will be enough:

" 'Par l'epoux quelque foi une jeune mystique
Entend un autre epoux que celni du Cantique.' "

(A young woman who is mystical, understands another spouse than that of Canticles.) From which it would seem as though the Roman Catholic Church admitted that there might be objective realities in Borderland wedlock (so far at least, as appears on the surface), eschews objective phenomena on the Borderland, and tries to keep her mystics entirely in the realm of subjectivity—a realm where illusions arise through the ease with which it is confounded with objective planes, and where a well-trained mind is needed to distinguish between that which is suggested or thought hypnotically, and that which actually occurs. And yet, it is for a Divine Bridegroom on the Borderland that the Church has long trained her nuns in the life of ascetics. For in various forms of austere self-denial, asceticism as well as total suppression of the sex-nature is an absolute preliminary step to Borderland nuptials, though only for a time. The question arises, however, who is this Divine Spouse of the purified and ecstatic nun? Is it Christ? Or is it an angelic lover? The Church says Christ when the union is uplifting and insists that the relation is entirely mystical and not at all objective. I think from the testimonies in which I have adduced from church writings an angelic bridegroom is not impossible. And it is quite conceivable that, where a nun believes that Christ is the only Borderland Spouse, her prejudice may result in her lover's appearing to her as Christ, just as the mediaeval witch who believed that her Borderland spouse could only be the Devil, was pretty sure to see him with horns and hoofs and to be whisked away (subjectively) to a Witch's Sabbath of diablerie.

Madam de Guyòn, indeed, admits that "the vision is never of God himself nor scarcely ever of Jesus Christ, as those who have it picture it to themselves: it is an Angel of Light, who according to the power which is given to him by God for this purpose, causes the soul to see his representation, which it takes for himself." (That is, the vision is subjective, probably an hypnotic suggestion induced by the angel.)

The following stories of saintly Catholic women who became espoused to a Borderland bridegroom, show that they were untrained in distinguishing subjective from objective phenomena. No wonder then, if they should mistake an angel for Christ himself.

St. Mary Magdalene, born of the illustrious house of the Pazzi at Florence * * * * burned with so great a heat of divine love, that she would at times exclaim "O love, I can bear thee no longer!" and she used to be forced to cool her bosom with a copious sprinkling of water. * * * * By Christ she was wedded with a ring, and crowned with a crown of thorns; whilst by the Blessed Virgin she was covered with a most white veil, and by St. Augustine, she had twice written upon her heart, "the Word as made flesh." Being rapt out of her senses while embroidering, she used, though the windows were closed up and her eyes veiled, to proceed with her work and finish it most accurately. * * * * She was canonized by Clement IX. in 1669. (Breviary—Nuns and Nunneries, 37-38.)

St. Rose of Lima.

"The first flower of sanctity from America was the Virgin Rose, born of Christian parents at Lima, who even from the cradle shone with the presages of future holiness; for the face of the infant being wonderfully transfigured into the image of a rose, gave occasion to her being called by this name; to which afterwards the Virgin Mother of God added the surname, ordering her to be henceforth called the Rose of Mary. At the age of five she made a vow of perpetual virginity. * * * *

"Having wondrously familiar intercourse, by continual apparitions, with her guardian angel, with St. Catharine of Sienna, and the Virgin Mother of God, she merited to hear these words from Christ—Rose of my heart, be thou my spouse. At last being carried to the Paradise of this her spouse and glittering with very many miracles, both before and since her departure, Pope Clement X. enrolled her with solemnity in the Catalogue for Holy Virgins." (From Breviary?)

The following are extracts from the Bull of her canonization:

"At this time she was favoured with the following revelation: There appeared to her in her sleep an extraordinary person, beautiful above all the sons of men, habited like a sculptor on a festival-day and he seemed to court her as a lover. Before Rose would consent to his proposal she set him a task, namely, to carve a piece of marble; and she bade him return again shortly, when the sculpture should be finished. At the return of her spouse, the virgin blushed when she perceived the task she had assigned him was accomplished in a manner beyond his strength; and he opened to her his workshop, where were a number of elect virgins, working like men at carving and polishing marble. She discovered that they were his espoused, by the style and beauty of their nuptial dresses; they were moistening the stones, and preparing them for cutting by their tears, which dripped upon them. Rose perceived that she was to be dressed like one of them, and prepared to be advanced to a like espousal. * * * * The mystery was discolsed to her thus: On Palm Sunday, when Rose was absorbed in meditation, in the chapel of the Blessed Virgin of the Rosary, her lover thus addressed her: 'Rose of my heart, be my love.' The virgin trembled at the sweet voice of her Divine Spouse and at the instant she heard the voice of the Mother of God, wishing her joy, and saying, 'Rose, it is no mean honour which this my Son proposes to you.' * * * * After this revelation, Rose began to torture herself more than ever. * * * *

When her Spouse did not appear to her at the accustomed hour, she used to admit an angel (who was always visibly present with her as her guardian) to her confidence, as his footboy or valet (*ut pararium aut vereda reum*)."

Various miracles were said to have been wrought through St. Rose of Lima: such as, for instance, the materialization of bread and also of honey in her father's house in time of scarcity; also, in answer to prayer, the payment of a debt of her father by a stranger who appeared at the house, bringing the money wrapped up in a cloth.

"These are the assistances which her divine Spouse promised to the parents of Rose, that he would give her as a dowry, when he wooed her in the character of a heavenly sculptor." (Ibid.)

In this last, we seem to be getting back to these angelic bridegrooms spoken of in ante-Nicene Christian literature, who materialized gold and other precious articles for beloved earthly spouses.

But, it may be asked, are these unions with a heavenly spouse mere marital unions with angels, and does God (or Christ, as His human manifestation) play the part in them? By no means. God is a party to Borderland wedlock in its highest aspect, whether that wedlock be an objective marriage union (as in earthly wedlock) or a subjective and mystical blending with a divine invisible intelligence. Mme. de Guyon was right in saying that her love toward God and God's love toward her was the blissful feature in Borderland experience. There are lower aspects of Borderland wedlock than that which includes union with God; which are subject more or less to illusions, fantastic or diabolical. Only when the earthly partner aspires to the Divine Soul of all things, does the supreme bliss of union with the angelic mate transpire. At such times one is fain to apply such a conception as that of Mrs. Gillen, a London teacher of Divine Healing, which is:

"The Universe consists of three factors—a Thinker, outward Expression of His thought, and the realm of Mentality which lies between that Thinker and His Expression, and which is the means by which the Uncreate shapes what it thinks into Expression in physical, material forms. If we conceive this Great Thinker (God) as the central nucleus of a great circle,* which embraces the Universe, his Expression of thoughts, motives, feelings, will be on the rim of the large circle, and the sphere of Mentality, where those thoughts are being moulded into shape previous to Expression, will be the zone lying between the nucleus, or Central Thinker and the outer rim of His all-embracing circle. Each living creature, as part of this great circle is a sector in the circle, thus: Such a sector, consists as does the entire circle, likewise of three factors, (1) that which thinks; (2) mentality, where thoughts are shaped; (3) the body, the material life, where spirit finds expression as outward form. Nos. 2 and 3—mentality and the bodily form—are but the instruments of the spirit, the thinker within us. The thinker within us is part of the Great Thinker at the centre of the circle of the Universe. So that, according to Mrs. Gillen, it is incorrect to say "I *have* a spirit." We should say "I am a spirit," i. e., "I am part of God." When the zone of our mentality is kept unclouded between our material, bodily form and that within us (up at the point of the sector) which thinks, we are, as will be seen, in unbroken communication with the Great Thinker, God, who is Himself all in all: for our thinking self is part of Him. The application of this conception from Mrs. Gillen's point of view, is that when that zone of mentality is unclouded by dislike or other antitheses of love, then disease and other mundane annoyances no longer exist for us; since, being part of God, and being one with Him at the heart of the Universe, we have His power to create outward circumstances.

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*This should be, of course, a sphere, and it is thus that Mrs. Gillen prefers to conceive the Universe. But a circle, being flat, is easier of comprehension by non-mathematicians when divided into sectors, and I have therefore adopted Mrs. Gillen's method of this easier representation.

From my own point of view, this conception has a bearing on the third and highest degree in the mysteries of Borderland wedlock. But before enlarging this, it may be well to begin with the preliminary training necessary to render one the Borderland wife or husband of an angel, and to set forth the three degrees in order with such detail as may be allowable in a work like this, which is intended for the general public. The readers hope to profit by these instructions for personal development, inasmuch if one can persuade one's earthly partner to try, with one's self, to live the life which is obligatory for Borderland wedlock, it brings the Kingdom of heaven into earthly relations.

The preliminary training necessary may be summed up by the admonition: Live a correct moral life, according to our own highest standard (a standard, by the way, which should never be fixed, but always moving onward to still greater excellence) and to strive to think clearly and to form accurate conceptions of ideas, to express conceptions with exactness, and to follow Truth, wherever she leads, and whatever your previous convictions upon any given subject. Especially, you must have such high and clean thoughts about sex that you can think about it, read about it, and talk about all the details without agitation, without grossness of thought, and with as impersonal a state of mind as if you were discussing the circulation of the blood. And you must learn to recognize the educational value of sex attraction in the evolution of humanity from savagery into civilization. Chiefest of all, learn that sex is holy before God and the angels. During this preliminary training, all sex union must be refrained from absolutely. The nervous energy which has hitherto been evoked for expenditure in this direction must no longer be expended, but, by continual self-mastery, be returned to the system for its upbuilding. Gradually, as the neophyte who has habituated himself to a pure-minded and idealistic conception of sex becomes accustomed to thus maintaining self-poise, no matter what the temptation, there will spring up in him a joy in his own power which will amply repay him for all his struggles.

This process may take months, or it may take years. The Hindus have a saying that he who seeks a Borderland spouse must have known no woman for seven years. But whether the process be long or short, whether the partner be sought by Borderland or on the earthly plane it must be perfected before the first degree can be entered upon. For those who would like to have at hand some text-book to help in passing this preliminary training, I would recommend a little pamphlet entitled, "Practical Methods to Insure Success," published by the Estoric Publishing Co., Applegate, Placer Co., California. It will be sent free on receipt of postage. It is written from such a standpoint that it can be placed in the hands of young people, and it is suggestive rather than exhaustive of the subject under consideration. But it has nothing to do with Borderland wedlock, and, so far as I can tell, it seems to make this training—which I call preliminary—almost the ultimatum. It also advocates incidentally one or two ideas, such as astrology, and the necessity for occasional fasting, the truth of which, it seems to me, remains to be proven. But, apart from these things, it is so admirably written that it will furnish a safe groundwork for any neophyte to build his ideal sex life upon, and therefore, I earnestly recommend its perusal. The first degree should not be entered upon, as I have said, until the neophyte is proficient in this preliminary training.

The first degree embodies the teaching of what is known as Alpha-ism. Its principle is: "No sex union except for the distinct purpose of begetting a child." The bearings of this principle will be discussed in my forthcoming treatise on "Psychic Wedlock." Suffice it to say here that the staunch adherance to this principle has uplifted and brightened the lives of many husbands and wives who had begun to find the marriage state a hell on earth. But it is a mistake to consider this the most advanced teaching regarding the marital relation. It is beautiful, helpful, and necessary to acquire for those who would live the life of the truly wedded; but it is only the first of the three steps which lead husband and wife up to the ideal relation. In *The Christian Life*, a journal edited and published by Rev. J. D. Caldwell, Chicago, the teaching of Alpha-ism will be found set forth clearly and reverently.

Following this should come another pamphlet called "Diana," written by Prof. Parkhurst, the astronomer, and published by the Burnz Publishing Company, New York, price 25 cents. This pamphlet is, unfortunately, marred by being printed in the reform spelling, but one forgets after a page or two. It is a psycho-physiological essay, intended for husbands and wives; written from a high standpoint, and in refined language. *Diana* will furnish the initiate with a bridge between the first and second degrees; and it is one of the most important and helpful contributions to the sex question that has ever been published.

It is evident that this first degree is likely to prove a stumbling-block to those who degrade this beautiful principle of Alpha-ism (a principle embodied in the Scriptural command, "Be fruitful and multiply") into an excuse for sowing more seed than is needed to produce the harvest. The man or woman who, whether on Borderland or in earthly wedlock, thus persistently distorts the above Scriptural command into a permission for something very different from what was intended will never get beyond the first degree of the marriage relation. To create children is not only a high and holy joy to every right-thinking husband and wife, it is a solemn duty imposed upon them by the laws of their own being. And the psychic who shirks this duty in Borderland wedlock, although maintaining marital relations by the angelic spouse, will be misled by all sorts of fantastic or diabolical illusions. Conversely, wedded on the Borderland to an angel, holds fast the thought of the duty of the married to create (under suitable conditions), will ere long be shown the truth, i. e., that between two people dwelling on entirely different planes of matter, while the marital relation is possible, lawful and beautiful, to beget a child is impossible until the earthly partner shall have crossed to the world beyond the grave.

The principle of Alpha-ism must be mastered by those who aspire to the second degree, whether on the Borderland or the Earthly plane. The second and the third degrees have this principle for their corner stone. In none of the three degrees is it allowable to sow the seed except for the distinct purpose of begetting a child who has been reverently and prudently planned for at just that time. Nor is it ever allowable to waste the seed by throwing it away (and with it the psychic energy). The second degree launches the initiate upon the perilous waters of sense-gratification. If his previous training has enabled him to build a staunch craft for the voyage, well and good; otherwise, he may be swamped at the first wave, or, if he rides its crest, and the crests of succeeding waves, he may rashly venture too near the fatal rapids and be engulfed. It is possible that was the error into which Josephus says the "giants" fell when they trusted in their own strength. The second degree was practiced in the Oneida Community, for thirty years, and was obligatory upon all its male members. The result was highly satisfactory despite the society's unsavory practice of community of women. They do not seem, however, to have seen the necessity for a similar training of female members. The author of that popular novel, "The Strike of a Sex," has been preparing a book called "Zugassent's Theory," which is intended to deal with this method from a popular standpoint. I have not seen the work (which I believe is now going through the press) ; but from what I know of the author's reputation and his efforts hitherto in the cause of social purity, I feel that the book is likely to be judiciously worded and to be an aid in mastering the second degree. I doubt, however, if it deals with the training of the feminine partner. But the principles underlying the training of the man may be studied out from such a work and applied by the woman. The author is George N. Miller, 59 Murry St., N. Y. The second degree is the most difficult of the three degrees to acquire, physiologically speaking, inasmuch as it exacts supreme self-control at a crucial moment. Those who have never attempted this degree, when told of it, are apt to either declare it impossible, or to scorn it as undesirable. But those who have once mastered this degree would no more forego the power which is now theirs, than a freed prisoner would voluntarily return to his dungeon. This way lies the path of liberty and life and joy, and they who have once trodden it in the perfect fullness of magnetic union with a dearly loved spouse, will never care to stumble along the old paths. The Oneida Community despite its social mistake of promiscuity, has made the human race its everlasting debtor, in that it has left a thirty years' scientific experiment on record detailing the methods and attesting the value of this second degree.

But let it never be forgotten that this second degree must be built upon the first degree Alpha-ism. To make use of it as a means to increased sensuality is to degrade it, and to do so effectually bars the initiate from entrance upon that third and highest degree where all joys, physical, mental, emotional and spiritual, reach an intensity besides which the joys of the first and second degree pale as a candle-flame pales in the radiance of sunlight. Moreover, if this degree be thus degraded by the initiate, it is almost certain to bring nervous diseases of a very distressing character in its train.

On the third, and highest degree, no book has yet been written, so far as I know. The teaching seems to have been handed down orally or else by pictured symbolism or mystic rite, understood only by the initiates of this degree. I am now compiling notes for my work on "Psychic Wedlock" which I hope will take up the projected three degrees in more detail than is possible in this treatise. For the present, I can only lay down a few general principles, and these principles which cannot be fully grasped by any except those who have mastered the first and second degrees.

The Hindus have the theory that God can enjoy food, drink, and, in fact, all sense-pleasures only through the offering of an earthly devotee. Therefore, the devout Hindu offers God a share in all his gratifications of appetite—thus living out, indeed, the Christian Apostle's admonition of "whether we eat or drink, do all to the glory of God." Too often, it is true, this doctrine is perverted into an excuse for sensual excesses, the debauchee soothing his conscience by an offering to the god whom he worships. Thus has this sacred inner mystery become degraded by the unworthy, even by the tried and staunch initiate of the first and second degree, unless he holds grace as he enters upon this third degree, unless he holds fast to the teaching, "aspire to the highest." Only in reverent and earnest aspiration to the Divine, to the source of all things, to the Eternal Energy of the Universe, may this third degree be entered upon, either in Borderland or in earthly wedlock. The more intense the emotion, the more absolute the necessity for aspiring with all one's faculties to union with the Divine. Every element of selfish desire must be eliminated; one must aspire at that time because it is right and beautiful to bring one's holiest and tenderest and most ecstatic emotions into the presence of the Great Thinker, in order that they may there be purged of all dross and be a worthy expression of our own best self. That is the first half of this highest degree. The second half is entered upon when spontaneously—not from selfish desire—it dawns upon us that to offer God a share of our pleasure at the moment may give him pleasure. When single-heartedly, and in all sincerity and benevolent feeling toward God we invite him to become the third partner in the marital union, then, indeed, do we understand what it is to love and to be loved. We enter thus into a personal relation with God, in which Impersonal Force though He be, we realize vividly that we are one with Him, and with Him one with all the universe. For that in us which thinks—the apex of our particular sector of the circle of the universe, is, on the one hand, in unclouded relation with our physical self on the outer rim, and on the other hand, it is merged into the Great Thinker, the Great Nucleus who is at the centre of all creation. From that moment, we are able to say to this Pantheos, Great Thinker, to this All-Pervading Energy, "My *friend!*" (And inasmuch as God is love in the fullest possible sense of that expression, the connubial bliss of Borderland lovers is increased tenfold.) From that moment, we know what it is to truly love God. This divine trinity in unity must be the final goal of Borderland wedlock, if such wedlock is to be permanent.

It is in this sense, I am inclined to think, that Mme. de Guyon, St. Teresa, and other mystical Spouses of Christ, received the Divine Bridegroom. Subjectively mingled with this rapturous union with Deity, no doubt, were the experiences of union with the angelic husband, of whose very existence as such they were unaware, confounding him with the Impersonal Deity who was the third element in their union. Then, too, we must remember that these women, intelligent as they were, were untrained in the nice distinctions of the subjective and objective, hallucinatory, veridical, automatic, telepathic, sub-conscious, etc., evolved by the modern Society for Psychical Research, and other recent investigators of the occult. Moreover, there are psychical experiences in Borderland wedlock which are subjective while they seem to the untrained occults to be objective. Of such a nature (apparently) was the experience of a Philadelphia lady, a Spiritualist, who told me of her spirit husband. She was a widow, and this spirit was a deceased lover from whom she had been separated in youth by a misunderstanding. He returned from the world beyond the grave to explain matters, and to reclaim his lost love, and finally, proposed that she should consider herself to be his wife from that time on, assuring her that it was so recorded in his land. Thereafter, on several occasions, she experienced (when she was by no means prepared) a series of galvanic shocks extending upwards through her body. These were doubtless hypnotic suggestions to prepare and train her for experience of a more objective character. The manifestations, however, were interfered with by the return of a chronic complaint of the liver with which she had suffered at intervals for years.

If it be asked how a misty, vaporous being, such as a ghost is popularly supposed to be, can sustain an objective marital union on the Borderland, I reply that the ghost is not mist-like in reality, but only appears so because he is in a new world of matter, with a more extended scale of vibrations per second for the various forces of sound, heat, light, and electricity than obtain upon our earthly plane. Beyond the last faint violet ray of the spectrum, science has demonstrated that there are rays of color to which we are blind, but which so lowly a creature as the ant can perceive. Dogs can trace a scent of which we have no perception. Many people are so color-blind as to be unable to distinguish a red from a green light—a fact brought out some years since very markedly in an examination for railway service in England. An astigmatic person is almost, if not quite, blind to a fine line running in some one direction. Recent experiments by Galton have shown that cats and birds are sensitive to a whistle which is inaudible to the human ear. If our inferiors in the animal Kingdom reveal such marked superiority to ourselves in sensitiveness to vibrations, is it unlikely that our former equally and now our superior, the deceased human being who has passed out of earth-life into a wider realm, shall also acquire sensitiveness to a wider range of vibrations? The ghost probably senses all things on our plane, plus a great many more things on his own. Our sensations are included in his, but his extend far on each side of our own. Therefore we cannot perceive his form or hear his voice in all his material relations, because he is in a world where forms, colors, sounds which we are physically incapable of perceiving—except in the exalted condition of the clairvoyant or Clairaudient—are part and parcel of his daily life. When we see him, we see only through the narrow range of our own limited scale of vibrations; so that we see him but in part, and therefore mistily, or hear his voice but faintly, or perhaps not at all, as it may cover a range of vibrations per second quite one side or the other of our own scale of sound vibrations. For this reason, he is often obliged to speak to the psychic by the interior voice—an hypnotic rendition, apparently, of his voice through the medium of her subconsciousness. For this reason, because his voice is not audible, as a rule, to her physical ears, the psychic must learn to discriminate accurately between this interior voice and the voiced imaginings of her own sub-consciousness, which will utter themselves quite as audibly as does the interior voice if the psychic has not acquired the faculty of holding her sub-consciousness will under control. With experience, however, the discrimination comes in time to be made inerringly, as St. Teresa has stated.

Through the interior voice, a Borderland mystic may be wooed and won as a wife if she be clear-headed and keep the moral law with scrupulous care. She does not need to be clairaudient to hear her lover's voice interiorly. Nor does she ned to be clairvoyant, if she be willing to go it blind, so to say. She is then in the condition, however, of a person who is totally blind; and who is almost totally deaf. Since she needs to be on the alert quite as much as if she were dependent on an ear-trumpet, in order to make no mistake in catching the remarks made by the interior voice. Nevertheless, even people who are blind and people who are deaf may fall in love with some one on this earthly plane and marry despite the defective means of communicating ideas Fortunately there are other means of transmitting ideas than by the interior voice or by the eye or the ear. In this connection the following article by Paul Tyner, on "The Sixth Sense and How to Develop It" in *The Arena* for June, 1894, offers a suggestive thought.

"I have said that I regard psychometry as the key to the development, on rational lines, of the sixth sense. Psychometry itself seems to be a development on the psychic side of that physical sense, which is at once the finest, the most subtle, the most comprehensive, and the most neglected of all the five senses—the sense of *touch*. While distributed over the whole surface of the body, through the nervous system, this sense is more delicate and sensitive in some parts than in others. The marvelous possibilities of its development in the hands are shown in the cases of expert silk buyers and of coin handlers. The first are enabled merely by touch to distinguish instantly the weight and fineness of a score of different pieces of cloth hardly distinguishable to the eye. Girls employed in the mints, while counting gold and silver coins at an astonishingly rapid speed, detect at once the minutest difference of overweight or underweight in the coin passing through their hands. The remarkable sensitiveness developed by the blind in the tips of the fingers, under such scientific cultivation as that provided in the Perkins Institute, of which Laura Bridgman in the past and Helen Keller in the present, are such conspicuous examples, is familiar to most readers.

"It may not be so generally known that recent post-mortem examinations of the bodies of the blind reveal the fact that in the nerves at the ends of the fingers, well-defined cells of gray matter had formed, identical in substance and in cell formation with the gray matter of the brain. What does this show? If brain and nerves are practically identical, is it not plain that, instead of being confined to the cavity of the skull, there is not any part of the surface of the body that can be touched by a pin's point without pricking the brain? It shows, moreover, I think, that all the sensations generally received through the other physical organs of sense, may be received through the touch at the tips of the fingers. It proves that a man can think not alone in his head, but all over his body, and especially in the great nerve centers like the *solar plexus*, and the nerve ends, on the palms of the hands and the soles of the feet. The coming man will assuredly perceive and think in every part, from his head down to his feet. Need I suggest the importance of remembering, in this connection, how much in our modern life is conveyed by the hand clasp, or the deep delight that comes to lovers in caressing touches, when impelled to pat the hands or cheek of the beloved one, or to stroke her hair? It is through the emotional life that our sensitiveness is led from the physical to the psychic plane of sensation."

It is through the nerves of touch that Borderland wedlock becomes objective. The lover may remain forever invisible, as in the fairy stories, materializing only at night, and then only to the touch of those nerves most capable of sensing his tangibility. But, ghost though he be, it was the testimony of Reginald Scot in his "Discourse of Witchcraft" that the Witch "hath more pleasure that way, they say, than with anie mortall man." The angelic bridegroom, as well as this earthly partner, must live a correct moral life and think clearly; and this means that he must exercise a tenderness, a considerate regard for his wife's comfort and happiness, and also a marital self-control of which too many earthly men are ignorant. No wonder then, that, on the plane of sentiment, she should prefer this ghostly spouse to "anie mortall man." And on the plane of physiological relations, I think I have already shown that the husband who is an initiate in the third degree, who has trained his wife therein, can assure her of *connubial bliss which is perpetual.* The Borderland bridegroom has this advantage, too, over the earthly bridegroom; being able to read his partner's thoughts, he can adapt himself to her most delicate fluctuations of sentiment at a moment's warning, and so never fail to be truly her companion.

"If one could prolong the happiness of love into marriage," wrote Rousseau, "we should have Paradise on earth."

In my own case, Paradise—the Kingdom of Heaven—has come into my earth life, and it has come through my heavenly bridegroom.

OPHIOPHOBIA.

By

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IF AN apology be required for discussing a subject remote from personal lines of practice, it may be said that both in general practice and the practice of a specialty, neurotic states must receive attention. Many persons, too, in or out of the medical profession, accidentally have their attention called to subjects not directly connected with their special work but which arouse sufficient interest to lead to some degree of investigation. This particular subject has frequently been brought to the writer's attention by field work in archaeology—a more general and permanent subject of extra-professional interest.

During an informal discussion of the subject, a high school teacher offered to assist in the study by assigning snakes as the general topic of a composition by pupils, in their regular course. Nine years have elapsed since the essays were collected, the delay being partly accounted for by the almost inevitable neglect of matters not immediately pressing, but largely by the fact that, when the analysis of the essays was begun, with reasonable promptness, it seemed unwise to publish immediately an article that might apply in a too personal way to a body of young persons.

Although it was impressed on the class that each should, somewhere and somehow, express his or her personal sentiments with regard to snakes, 5 of 47 girls and 11 of 43 boys turned in essays from which no conclusion could be drawn. Many of the others expressed sentiments only in a very indirect way, but the conclusions induced were in each instance probably correct and the error undoubtedly is self-correcting in the aggregate.

Of the total of 74 expressions of sentiment, 55 (slightly over 75 per cent.) were ophiophobes, 23 (slightly under 25 per cent.) were neutral, 1 (1+ per cent.) corresponded to the definition of ophiophilia. This was a girl who handled and petted snakes freely. Another girl, herself strongly ophiophobic, described ophiophilia in a boy, very likely one of the class. Incidental handling of snakes in self-defense or as offensive measures, skinning, removing of rattles, etc., were not counted as indicating ophiophilia. The girls, in mentioning such handling, practically always expressed ophiophobic or neutral sentiments. Many of the boys, in accordance with the general tendency of the sex to objective rather than subjective expression, described such handling by others (real or fictitious personages) without comment and these were put down as neutral, though probably many were ophiophobes. The statistics by sex were: Girls, total expressing sentiments, 42; ophiophobes 36 (86+ per cent.); neutral 5 (12— per cent.); ophiophiles 1 (2+ per cent). Boys, total expressing sentiments with qualification just made, 32; ophiophobes 19 (60— per cent.); neutral 13 (40+ per cent.).

It may be questioned whether the case of ophiophilia occurring among the girls and the case of a boy, doubtfully in the series, mentioned in another girls's essay, or similar cases, justify the term, especially since the termination -philia implies a neurotic state quite as strictly as does the termination -phobia. For example, a person who catches a spider in the hand may appear arachnephilic to an arachnephobe and one who has no special fondness for cats or even dislikes them but who is devoid of any horror in regard to them, may appear ailourophilic to the still rarer ailourophobe. The great majority of human beings are fond of dogs while cynophobes are extremely rare; even the comparatively few persons who dislike or fear them, being entirely free from any such sentiment of horror as pertains to snakes and less commonly to spiders, other insects, and rarely cats.

The mere fact that most persons are ophiophobes does not render the treatment of snakes like other animals an indication of ophiophilia.

Ophiophobia is the commonest type of -phobia, and it differs in many respects from various other neuroses designated by the same termination. Perhaps this may be best illustrated by considering a series of -phobias. Photophobia does not really indicate fear at all, merely disinclination toward a disagreeable sensation. The disinclination which many persons have to touching velvet, peach skin, etc., is similar but the discomfort is even less. Phthisiophobia, acrophobia, thalassophobia, brontophobia, even agorophobia and claustrophobia (for which the proper all-Greek term does not seem to be known), are all more or less strictly fears of real danger, though carried beyond logical limits and more or less attended with disgust in the first case and peculiar morbid ideas in the remainder. Ophiophobia is by far the commonest phobia in which horror is the essential element, although even this is originally based on fear of real danger and more or less confused with this element at present. It presents a strict analogy only to arachnephobia and a few other horrors of animals and possibly of some few plants. In prevalence it seems to rank about equally with necrophobia (which should not be confused with thanatophobia) but the peculiar shade of horror is different and owing to lack of discrimination in the vocabulary of most languages, difficult to describe in words. In the aggregate, it may be said that the latter horror involves a superstitious element lacking in the former, but many persons, even under present conditions of civilization and religious or negatively religious training, preserve the snake superstitions of primitive peoples, while necrophobia may persist in spite of an entire disbelief and even an absolute lack of sub-intellectual sentiment along the lines of superstition connected with dead bodies. Incidentally, not all primitive peoples are superstitious as to snakes. A rather interesting illustration was given at a recent lecture. The lecturer, describing the snake ceremonies of the Hopi Indians, stated that the Navajos, visiting as spectators, would spit on the snakes and the Hopi priests, to show their contempt and disgust, and after he himself had skinned a snake and washed his hands, a Navajo Indian peeled off the cake of soap which he had used, to get rid of the uncleanness. Yet many other Indian tribes hold favorable superstitions regarding snakes or, if not, handle them freely and eat them.

The exact manifestations of ophiophobia very considerably and somewhat contradictorily, especially if no allowance is made for the degree of emotion felt or expressed by the individual, in proportion to his own standards of reaction to nervous stimuli, and if, as is often the case, the element of physical danger is confused with the pure -phobia. It may be pointed out, also, that the fear of poisoning or constrictive injury, is not in itself ophiophobia, but a logical fear of physical danger, even if contrary to fact and due to general ignorance or special misconception. Some persons are driven to violent hysteric manifestations by the mere sight or thought of a snake, but ophiophobia, like necrophobia and the rarer animal zoophobias, consists mainly in a dread of contact. Indeed, the horror may be strictly limited in this way, while the sight of a snake, even in a dream, occasions no fear. As in the case of necrophobia, the dread of contact may be sharply limited or quite extensive. For example, as mentioned or implied in several of the essays, a girl may go into hysterics at the sight of a snake and yet wear a snake skin belt; while a man who experiences little mental shock at the sight of a snake, may dread the contact with a dried skin, rattle, bone, a fossil snake or even a toy, bit of jewelry, model or picture representing a snake. Likewise in analogy with necrophobia, the horror or sense of uncleanness may extend to objects and persons which a snake has touched, and may or not be abated by a cleansing process or by the mere lapse of time. For example, many persons will not crush a snake with the shoe and will not pick up a stone or stick which they have thrown at a snake, and in driving, will instinctively steer so as to avoid running over a dead snake in the road, although, obviously, the time is too short to allow a logical train of thought from the initial desire to avoid rendering the tires unclean. The extension of ophiophobia—as of necrophobia—to persons may break off a romance, as alluded to in two or three of the essays, or may lead to avoidance of hand shaking or while retained in theory, may be set aside on account of overmastering personal friendship or through motives of courtesy.

Ophiophobia and ophiophilia may be closely associated in either direction with hatred and the desire to kill. An ophiophobe may be merciful toward snakes as toward other animals, and hence may have no desire to injure them unless they are dangerous, or actual fear or loathing may prevent any offensive toward them, or, again, with or without belief in the demonology of snakes, even in the sub-intellectual sense, he may kill them "on principle." Similarly, ophiophilia may really imply more or less kindly feeling towards snakes as toward other lower animals; but in this sense, the full significance of the term as indicative of a neurosis is not reached. True, neurotic ophiophilia, like necrophilia, is very apt to be associated with cruelty and thus to be essentially Sadistic, although by no means necessarily implying direct sexual ideas or practices.

SELECTIONS.

CLINICAL NEUROLOGY.

Cystoscopic Examination of the Bladder in the Psychoses.—Barnes and Caulk, *Journal Mo. State Medical Ass'n*, report that a large percentage of diseases of the central nervous system have as their initial symptom disturbances of bladder function, and as so many surgical diseases associated with bladder disturbances (particularly prostatic obstruction) are either complicated by or associated with tabes, the importance of the subject is apparent. This bladder picture under reference has been commonly designated as the "tabetic bladder," evidently because it was supposed to be representative solely of tabes. Such is not the case, as it is found in several other diseased conditions of the central nervous system, and in individuals who have as yet been pronounced neurologically normal. Therefore the term "tabetic bladder" seems a faulty one. They feel convinced that this picture is strikingly suggestive of neurological disease, even though in many cases the findings have not been confirmed by neurologists. On this account, in an analytical study of 117 cases previously published, they were grouped into two classes in order to compare the findings: those which had been neurologically confirmed as having definite central nervous system disease, and those which had not been so confirmed.

The most constant and striking finding is the appearance of the internal sphincter. With the cystoscope in its normal horizontal position, there is a feeling of relaxation which one does not get in normal cases. On observing the sphincter margin, it has been found to be without striking appearance above and laterally, but as one approaches the floor it is observed that immediately the striae of the floor of the urethra can easily be seen external to the sphincter. Very frequently the scope may be withdrawn and the verumontanum brought plainly into view, the orifices of the utricle and ejaculatory ducts may be inspected. This cannot be done in the normal urethra, for the reason that, with normal tone, the musculature clamps so closely to the lens that inspection of the urethra is impossible. Such urethras are usually very insensitive and seldom require local anesthesia for examination. Associated with this orifice picture, the trigone is usually elevated, but seldom husky and hypertrophic, as behind mechanical obstructions; the interuretic bar is usually lifted and thin. Laterally the trigone at its tips frequently fans out into trabeculae, which spread out over the lateral walls of the bladder. The ureteral orifices have shown nothing in particular, except that in some cases they have been sluggish in their ejaculation of urine. With this picture of relaxation at the internal orifice of the bladder there is usually bladder trabeculation which does not always show particular characeristics, except that possibly it may be a little more delicate than trabeculation seen back of mechanical obstructions. The external vesical sphincter has been found spastic in 57 per cent. of the cases, 71 per cent. of this number being in tabetics. The bladder musculature was found weakened and in many instances very atonic in 53 per cent., and 82 per cent. of these were in tabetics. Roentgen-ray findings of the bladder were made with thorium, collargol and argyrol. These cystograms usually showed a clean-cut line below in the internal sphincter region; several of the very relaxed cases showing a funneling due to the material in the deep urethra, as has been observed at the Johns Hopkins clinic. If the bladder is filled with solution and a comparative plate is taken with the patient lying and then standing, there is noticed in tabetics a dropping down or sagging, with forward toppling of the bladder. This is probably due to the marked relaxation of the various bladder and prostatic supports, namely the ligaments and muscular supports in this region, and does not occur in normal individuals. This, they believe, is an observation which has not been previously demonstrated.

Of the 117 cases above mentioned, the diagnosis was made in the urological clinic in 46 per cent., and by the neurologist in 54 per cent.; 46 per cent. of the cases diagnosed by the systoscope were confirmed by the neurologist and 54 per cent. were not. Of the 54 per cent. of unconfirmed cases, 6.2 per cent. were later confirmed, these being two spinal cord tumors and a case of paresis; the remaining 48 per cent. of the unconfirmed cases were associated with prostatitis, prostatic hypertophy, bladder tumors, renal calculus, pyenophrosis, paralysis agitans and lead poisoning.

Urinary symptoms, such as frequency and difficulty of urination, occurred in 95 per cent. of this series, being about 60 per cent. in tabetics and 40 per cent. in the unconfirmed. Incontinence of urine of the paradoxical type was present in 34 per cent. of the cases, and of this number two-thirds were tabetics and one-third unconfirmed. Disturbances of the sexual powers presented one of the most uniform findings. In diseases of the central nervous system, either complete loss or marked disturbance occurred in 82 per cent. and in the unconfirmed cases about 50 per cent.

There was a great number of uremics in this series, which suggests the conclusion that many of the symptoms and toxic conditions which are suffered by patients with tabes dorsalis are due to the uremia; because a number of patients who were extremely weak, pale and toxic have wonderfully improved, and in several instances been relieved entirely of symptoms, by drainage and measures instituted to relieve the profound uremia. Forty-two per cent. were definitely uremic. Of this 42 per cent., 86 per cent. occurred in patients with confirmed central nervous system disease; 14 per cent. occurred in cases which were not neurologically confirmed. This shows a very high percentage of uremia in the definitely neurological cases.

An almost constant finding associated with this cystoscopic bladder picture was the relaxation of the rectal sphincter. The relaxation occurred in 90 per cent. of the cases in this series, about an equal proportion being found in the neurologically confirmed and unconfirmed cases.

In this second series, dealing exclusively with mental disorders, they report the analytical study of 188 cases, 158 male and 30 female. This group comprises 80 cases of paresis, 2 cases of tabes dorsalis with psychosis (not taboparesis), 9 cases of cerebral (spinal) syphilis, 13 cases of organic brain disease (not syphilitic), 11 cases of alcoholic psychosis, 11 cases of epilepsy with psychosis, 44 cases of dementia praecox, 6 cases of defective states with psychosis, and 12 cases of manic depressive insanity.

Paresis.—Of 80 cases, 40 (50 per cent.) showed a typical positive cystoscopic picture. In comparing the neurological and urological findings, the cystoscope gave a positive picture in 38 per cent. of the cases in which the neurological examination did not indicate a lesion of the spinal cord of the tabetic type. On the other hand, the cystoscopic examination showed only 74 per cent. of positive urological findings in cases where the neurological examination revealed a definite lesion of the spinal cord of the tabetic type. In regard to the 38 per cent. of cases above mentioned, in which the cystoscope revealed positive bladder changes while the neurological examination failed to discover these, it is claimed that 99 per cent. of all paretics have pathologically demonstrable lesions of the posterior columns of the spinal cord such as are found in tabes dorsalis. It may be possible that, although these posterior column changes as found in all paretics may not be of sufficient intensity to produce clinical signs in more than 34 per cent. of the cases, as found in this series, they may be of sufficient intensity to give rise to the bladder changes revealed by the cystoscope and which we have designated as positive.

Tabes Dorsalis with Psychosis (not Tabo-paresis).—Two cases, both male, and both unquestionably positive cystoscopically.

Cerebral (Spinal) Syphilis.—Eleven cases, of these 5 (55.5 per cent.) showed positive cystoscopic findings. Four of these are distinctly hemiplegic and the fifth has unilaterally exaggerated tendon reflexes.

Organic Brain Disease with Psychosis (*not Syphilitic*).—Thirteen cases, 4 female and 9 male, including arteriosclerotic dementia, senile dementia, multiple sclerosis and Huntington's chorea: In this group were 3 (23 per cent.) positive cases, all being arteriosclerotic dementia.

Alcoholic Psychosis.—Eleven cases, all male, including Korsakoff's syndrome, alcoholic dementia and chronic alcoholism. Of this group one case (9 per cent.) showed positive bladder findings, and in this, a case of Korsakoff's dementia, the knee jerks were absent, although there were no other signs of neuritis. These absent knee jerks may indicate a spinal cord involvement, although there were no other evidences of tabes, and thus explain the positive bladder findings. A second case of Korsakoff's had been looked on as a case of tabes dorsalis. The knee jerks were absent. In this case, as well as the preceding one, serological examination of the blood and spinal fluid was negative. This second case cystoscopically showed positive findings with the exception of an invisible verumontanum. Neurologically the case was uncertain for some years and cystoscopically, though classed as negative, is really doubtful and highly suggestive.

Epilepsy with Psychosis.—Eleven cases, male 3 (27 per cent.) with positive bladder findings. In 2 of these positive cases it was noticed that there was a backflow of semen into the bladder.

Dementia Praecox.—Forty-four cases, 36 male, 8 female. Of these 10 (22 per cent.), 1 female and 9 male, gave positive urological findings.

Defective States and Toxic Psychoses.—Six cases, 5 male, 1 female. One (16.6 per cent.) with positive bladder findings, this being a case of imbecility following a severe meningitis in infancy.

Manic Depressive Insanity.—Twelve cases, 10 male, 2 female. One (8.3 per cent.) with positive bladder findings.

In this series of 199 psychoses the neurological findings were such as to lead to the expectation of a positive bladder picture in 23 per cent., whereas this positive picture was found in 54 per cent. If cases are separated into organic and functional groups, the neurological and urological findings check fairly closely so far as the organic group is concerned. In other words, the cystoscope reveals positive bladder findings in a much larger proportion of the functional cases than was to be expected.

The appreciation of this bladder picture bears an important surgical significance, as its recognition will often spare an unnecessary operation and lessened postoperative incontinence.

PSYCHOLOGY OF HYSTERIA.—Wm. G. Somerville, in the *American Journal of Insanity*, writes that suggestibility and the subconscious play the most important rôle in the genesis of hysteria as they do in hypnotism.

It is probable that the greater part of the content of the subconscious (at least the part which mostly influences our conduct) are repressed wishes, wishes which are unethical or of which we are ashamed, or which are selfish; but not all necessarily sexual as Freud believes. So these repressed, submerged, or unconscious wishes control and color our acts, and make us as normal individuals do things wherby we may accomplish those wishes. How much more true it is of the hysteric, whose submerged complexes in the form of unconscious desires for sympathy, retaliation, freedom from work or disagreeable duties, or indemnity in the case of supposed injury, produce or bring about paralyses, anesthesias, amaurosis, or fits, as means for the fulfilment of their unconscious wishes. A similar example of how a selfish and therefore repressed wish may terminate in its fulfilment is quoted by the author: "A man wishes to go to the theater while his wife prefers the opera, but on account of his affection and consideration for the latter he purchases tickets for the opera. He drives the car, consciously intending to go to the opera, but unconsciously drives directly to a distant theater, too late to go to the opera, therefore accomplishing the fulfilment of his repressed and selfish wish. One who has read Freud's 'Interpretation of Dreams,' is struck by the fact that the interpretation of hysterical symptoms is closely related to that of dreams in that the manifestations of both are the results of repressed thoughts, and represent a fulfilment of a wish or a means to that end."

The essential difference between hypnotism and hysteria is that in the former there is a complete dissociation of personality; and ideas and suggestions given the subject by the operator enter directly the subconscious realm and there have full play, giving immediate expression and reaction, uninhibited by the conscious mind: whereas in the hysteric there is only a partial dissociation of personality; only certain repressed ideas, which originally existed in the conscious mind, placed there by auto- or hetero-suggestion, and later submerged with their emotional content, after a long or short interval, give expression or reaction, but also uninhibited by the conscious mind.

There is no difference between hysteria and the so-called "traumatic hysteria," the latter being the designation of that which follows an injury, the symptomatology of the two may be identical. If one sustains an injury of the arm, for example, which severs or injures the musculo-spiral nerve, there are found certain characteristic symptoms due to paralyses of the muscles supplied by this nerve, and an anesthesia of the skin corresponding to the area supplied by the nerve, loss of tendon reflexes, atrophy and electrical changes in the muscles involved. Such a case is readily diagnosed as traumatic neuritis. If, however, in another case, who has sustained a slight injury to the arm, a contusion, for example, which does not injure the nerve but which is followed by a paralysis of the arm with anesthesia, not corresponding to any special anatomical nerve distribution, without atrophy, or electrical changes, or alterations in the tendon reflexes, we can readily diagnose this as hysterical paralysis; and simply because a trauma has preceded it, we are accustomed to designate it more specifically as "traumatic hysteria" or a "traumatic psychoneurosis." In the first case it is very evident that the injury is the absolute cause of the paralysis; but in the latter case the injury *per se* has nothing to do with the symptoms. The trauma is an excuse, a suggestion, which involves an idea of the injury, which idea is elaborated in the subconscious mind of the individual as a false idea. Accompanying this trauma and based on a false idea that the injury was severe is a desire for remuneration, but in order that this may be obtained, that there may be a fulfilment of the wish, physical symptoms indicative of severe injury must be manifest. But to pretend such would be malingering, unethical and dishonest, so this *idea* is rejected, submerged, and relegated to the subconscious, where unconscious to the subject it causes the various symptoms of hysteria, viz., paralyses, anesthesias, pains, etc., and thereby accomplishes the fulfilment of a repressed wish, which the conscious mind was too honest to do. When these ideas are not repressed, and the subject consciously pretends the symptoms, we call him a malingerer or faker. But whether hysteria follows physical trauma or not, there is an object to be obtained, in the one case remuneration, and in the other sympathy, retaliation, freedom from work or disagreeable duties which otherwise must be faced. The wish to obtain indemnity or to get sympathy, or to shirk duties, is originally a conscious one, but being recognized as unethical is repressed, and in the subconscious mind is elaborated the means by which to obtain or accomplish the end wished. This takes place without the conscious knowledge of the patient and is therefore an unconscious deception in close relation with malingering, which is a conscious deception.

Fox says:—"Even though a patient with hysteric vomiting deliberately simulates hæmatemesis such deception cannot be regarded other than as a manifestation of a pathologic mental state. With no other object than to gain sympathy certainly no moral person would carry the deception so far as to seek, and to undergo, operations for supposed gastric ulcer. This type of deception is malingering only to the same extent as that of cases of hysteria in which simulated anorexia has terminated in death. Surely, malingering for the purpose of exciting sympathy, or wonder, is as much a symptom of hysteria as a psychic hemiplegia or a psychic amaurosis." The author does not agree to Dr. Fox's statement. The definition of *Malingerer* is, "one who feigns or induces sickness to avoid service or to shirk duty." It would, therefore, be correct to reverse this statement of Dr. Fox's, and say that a case of psychic hemiplegia or psychic amaurosis is as much a type of deception or malingering as the one who deliberately simulates hæmatemesis, or the malingerer who pretends to have a paralyzed arm. In either case they feign or induce sickness for a purpose, in the one it is a subconscious act, while in the other it is a conscious act. A subconscious deception, as is the case in all subconscious acts, can be maintained for a longer period, more effectually and with less effort than can conscious deception. Both types are pretenders or malingerers, as both set forth or show symptoms which do not exist. The hysteric with gastric pain and hæmatemesis simulating peptic ulcer, and the hysteric with right iliac pain simulating appendicitis, are victims of psychic pains, resulting from the subconscious desire for sympathy or to escape disagreeable duties. These pains are ideas of pain, projected by the subconscious psyche upon somatic parts, where they are interpreted by the conscious mind as real pain due to somatic cause, just as the kinetoscope projects upon a screen, pictures which, to those who do not understand their origin, might seem real. The conscious mind of the hysteric reasoning from the false premise of the subconscious, in the belief that he has a gastric ulcer or appendicitis, submits willingly to an operation. Some years ago the author operated on two cases of right iliac pain and removed normal appendices. They were cases of hysterical pain, and strongly suspected as such before the operations.

"That the symptoms of hysteria are means for the fulfilment of a wish, is sometimes quite difficult and may even be impossible to fathom, unless we can reach the submerged complex by psychoanalysis. Those cases in which the symptoms are what was feared, are in reality ones of disfigurement, and may be compared to dreams with a disagreeable content in which there is dream-disfigurement, and in the case of hysteria the disagreeable content serves only as a disguise for what is wished, or fear may cause symptoms as a reaction of defense,—'a psychic elaboration of the normal reaction of defense.' Hysteric paralysis may be interpreted as a dissociation from consciousness of the power to move the member involved, and hysteric amaurosis as a dissociation from consciousness of the images and impressions made upon the retina. So hysteric deafness is a dissociation from consciousness of impressions or sounds made upon the organ of hearing, and hysteric mutism is a 'dissociation from consciousness of the faculty of vocal expression of language.'

"Hysteria may be described as a functional nervous state closely related to hynotism, characterized by various and peculiar symptoms and phenomena, and dependent on suggestions, either auto or external. These suggestions accompanied by strong emotions produce ideas, in the form of wishes or desires, which ideas become dissociated or submerged memory complexes, and are the unconscious motives which determine the hysteric's symptoms and actions. The symptoms then are the expressions of dissociated or submerged wishes, and are unconscious means for the attainment of fulfilment of a wish. It is a comparatively easy matter as a rule to differentiate between the symptoms due to an organic lesion of the nervous system and the symptoms simulating such and due to hysteria or malingering. But to me, I must admit, that it is extremely difficult to distinguish between hysteria and malingering, and often impossible. Yet when we consider that psychologically, and in reality, the only difference is that the one results from a subconscious 'willing' and the other from a conscious 'willing,' one can readily see how similar they are, and thus explain the difficulty. The symptoms produced by the subconscious are maintained without effort and for a longer period than those brought about by the conscious mind, though this is not always true. In the former the symptoms continue even when not observed, while in the latter they may disappear when there is no fear of detection. But there is frequently a combination of the subconscious and the conscious."

The author concludes with a number of appropriate and illuminating case records.

CASE OF RED NUCLEUS LESION.—Ernest Sachs, in *Journ. Missouri State Med. Soc.*, cites a case in which the patient began to have symptoms of headache, October, 1916. These increased in severity until March, 1917, when a complete right third nerve paralysis developed. Blood Wassermann and spinal fluid Wassermann negative. Paresis of the right leg, with some hypaesthesia. About a month ago, the patient developed a violent tremor of his left hand, which resembled in every way, that of paralysis agitans. It stops on volitional movement. There is a typical "pill rolling" movement as seen in that disease. Reference was made to the theory of Ramsay Hunt, who claims that the lesion of paralysis agitans is in the globus pallidus of the lenticular nucleus. Tremor similar to that seen in this case has been described in lesions of the red nucleus. The fact that the third nerve is involved which passes through the red nucleus indicates that that is the site of the lesion. A focal experimental lesion made in a macacus rhesus monkey was shown in which stimulation at the site of the lesion produced tremor of one arm. This supports the view as to the location of this lesion.

PERONEAL PALSY OF OBSTETRIC ORIGIN.—Alfred Gordon, in the *Virginia Medical Semi-Monthly*, states that when during puerperium the patient is taken with fever and then gradually or rapidly a paralysis of the lower limbs with or without pain develops, the condition has certainly a septic source and transverse myelitis should be thought of. But infection may also attack peripheral nerve trunks and affect either one individual nerve or several nerves. In the majority of cases trauma is the direct factor in localized nerve disorders following confinement. Anatomical arrangements show conclusively that such accidents are possible. The nerve involvement during puerperium may be *slight* or *pronounced*. The first is usually transitory and it is due to a special autointoxication associated probably with the process of involution of the tissues of the genital apparatus after delivery. The lumbar plexus is the point of predilection, and as the neuritic symptoms are here confined to the territory supplied by the lumbar plexus, trauma could not be taken into account in view of the fact that only the branches of the sacral plexus are exposed during the passage of the head of the fetus or forceps delivery. This *slight* form of obstetrical neuritis was particularly studied by Leopold Mayer, of Copenhagen. By far more important from a practical standpoint is the other form of neuritis. It is an isolated neuritis confined to one indivdual nerve-trunk and presenting pronounced motor and sensory manifestations of a serious character, which are persistent and last for months or years. Even if the individual recovers, some traces of the old affection remain either in the form of some tenderness and a special sensitiveness to cold and changes of temperature, or else in the form of a weakness of a group of muscles, etc. Among all the nerves of the lower extremities the peroneal, or external popliteal, nerve is the most frequently affected. If we refer to the anatomy of this nerve, we find that it takes its origin from the fourth and fifth lumbar and first sacral root, but particularly from the trunk formed by the union of the smallest part of the fourth and the entire fifth lumbar nerves. This trunk is called the lumbo-sacral cord. The latter at its formation is situated on the ala of the sacrum under cover of the psoas. It descends into the pelvis and crosses the anterior border of the ala of the sacrum; otherwise speaking, it passes over the brim of the pelvis or over the sharp border of the true pelvis. A protracted labor with the head pressing unduly against the brim of the pelvis, or else forceps, are apt to injure the exposed lumbosacral cord, hence the neuritis of the peroneal nerve.

The subject of nerve involvement during puerperium presents a certain importance from a practical standpoint, as a neuritis may be confounded with a phlebitis. A failure in recognizing the true condition may lead to errors of treatment. When a neuritis is taken for a phlebitis, it means prolonged immobilization of the limb with subsequent muscular atrophy and loss of power. When a phlebitis is taken for a neuritis, it means mobilization of the limb, electrization and massage of its muscles, which is a dangerous procedure as a small clot may become detached from the walls of the inflamed vein and be driven to the heart and lungs.

A very careful examination is essential: a pain in the limb in puerperal patients does not always mean a pure neurits, and a somewhat increased size of the limb does not always imply a phlebitis. Each of these affections has its typical features. A diagnostic error is inevitably followed by a therapeutic error and sometimes by very regrettable results.

DISSEMINATED SCLEROSIS.—Byrom Bramwell, *Edinburgh Medical Journal*, summarizes the statistics of the two hundred cases, which he has personally encountered during his career, and ends with some interesting speculations upon the causation of the malady. His figures, it may be stated at once, disclose little that has not long been commonly accepted about disseminated sclerosis.

The disease—or perhaps one should write syndrome—usually known as disseminated or insular cerebro-spinal sclerosis is fortunately not common, at least by no means a rarity; that is to say, no reasonably busy practitioner could very well pass through his professional career without coming across one or more cases of it; and specialists in nervous diseases see it quite frequently. The symptoms have long ago been accurately catalogued, the diagnosis is not as a rule difficult, even in early cases, and the final ending can be predicted almost with mathematical certainty. In spite of the very careful study of many distinguished neurologists, the rest of the natural history of this disease is extraordinarily obscure. No one knows the cause or causes of it, no one can cure it, and no one can foretell with any accuracy what sort of course any given case of it will run.

The prognosis is unfavorable, though there are cases in which permanent arrest and even apparent cure of the symptoms are known to take place. In his two hundred cases he has met with three which appear to be instances of complete recovery, and with a handful more in which the downward progress has been so slow that the patients have lived for as long as thirty years and even more. To remind the profession, therefore, that recovery is possible, even though most improbable, and that the course of the disease is exceedingly slow, is to render a distinct service both to physicians and their patients.

The erratic manner in which disseminated sclerosis develops (or fails to develop) is well known, and is emphasized in every text-book. Dr. Bramwell's records provide many instances of these eccentricities. In many cases the downward progress is from time to time interrupted by periods of improvement or complete remission of the symptoms. These periods of improvement and remission are very deceptive, for they may lead the physician to give an unduly optimistic prognosis; and if any special line of treatment is being exhibited to attribute the amelioration to that treatment. Everyone who has had much experience of disseminated sclerosis knows that; although the patients often improve and, in some instances, apparently for a time get quite well, it is only very rarely that the improvement is lasting.

For years he has believed that the patches of sclerosis in the nervous system, which underlie the symptoms of this disease, are due to some toxin distributed to the nervous system by the circulation. Remissions and recurrences are easily explained on this hypothesis by assuming that there are separate periods of recurring intoxication, produced in all probability within the body (*i. e.*, not introduced from without, as, for instance, by metallic poisoning, which some authorities have suggested as the cause of the disease). Complete recovery is also explained by assuming that no further auto-intoxication occurs. The difficulty created by this hypothesis is that no one can detect or even suggest what the assumed toxin can be; and it is with the object of throwing some light upon this point that Dr. Bramwell has carefully analyzed his cases, though without any success other than that of a negative kind.

The shortest duration of any case in his series was seven months; the longest thirty-seven years. In 106 fatal cases the average duration has been ten years and eight months. Four-fifths of the patients were between sixteen and thirty-five years of age when their symptoms were first noticed; only in five did the disease begin (or appear to begin) after the age of fifty. It is this predilection of disseminated sclerosis for the flower of early manhood (and womanhood) which constitutes one of the most distressing features of this strange disease. In 129 out of 192 cases in which the status of the patient is recorded the patients were unmarried when the onset of the disease was first noticed. Neither heredity nor occupation is shown to have any influence on the malady in Dr. Bramwell's experience, though he notes the curious fact that the great majority of the patients were comfortably circumstanced and that only a very small proportion were really poor.

In common with the accepted authorities, he finds that venereal diseases have no influence as causes of the condition. The alleged or supposed causes were very numerous; so numerous and so varied that they have, one may say, no common factor. Closer investigation showed in many cases that the alleged or supposed causes had been actually preceded by some one or other of the early symptoms of the sclerosis. The patients were nearly always healthy, non-nervous, young men and women in good or fairly good circumstances; a very large proportion of them were engaged in household work or living in comfortable homes without any employment. These considerations certainly narrow down the field of speculation and inquiry into the causes of disseminated sclerosis; but they cannot be said to offer any positive guide to the seeker after knowledge about this serious and disabling condition. The only other hypothesis that has any adherents is the developmental, according to which the origin of the disease is to be sought in some defect of the neuroglial or nervous tissues which renders it more vulnerable than these tissues are in a normal individual. In the nature of things this is, and is likely to remain, a pure speculation; but it is worth noting, as Dr. Bramwell shows, that it does not exclude other etiological factors (*e. g.*, toxins) acting as occasional or additional causes. It possesses the further drawback that it is vague in expression as well as in conception: as an explanation it is merely a way of taking refuge in the inexplicable.—*The Hospital.*

PSYCHIC TREATMENT OF EPILEPSY.—William Stekel, *Zentralblatt für Psychoanalyses*, believes that a large percentage of the cases diagnosed as epilepsy are in reality neuroses. In the epileptic attack, there occurs a victory of the crimnal unconscious over the moral consciousness. He presents four cases to support his views. In the first, that of a fifteen-year-old school girl, the attack was occasioned by unconscious criminal (death) phantasies against her mother. The second case was that of a man aged thirty-two. In this case also, death wishes against his wife were revealed.

The third case, Stekel describes in much detail. The patient had a perversion, urolagnie. The analysis showed that this perversion was a derivative of a much deeper-seated pathological complex, sadism. The dream analysis traced this sadism back to its origin in early childhood.

The fourth case concerned a man aged thirty-seven. Here again criminal phantasies toward a brother-in-law were the determining factor. The history of this man with an account of the many unavailing methods of treatment which he had undergone for his epilepsy and Stekel's analysis and cure of him is most interesting.

Stekel's conclusions are as follows:

1. Epilepsy is, more frequently than we had previously thought, a psychogenic trouble.
2. In all cases, a strong criminality is in evidence, which has been repelled from consciousness as unbearable.
3. The attack stands for the crime, thus also eventually a sexual act which is a crime.
4. Pseudo-epilepsy is curable by psychoanalysis. It requires longer periods of treatment, since the splitting of the personality has progressed extraordinarily far.—*Psychoanalytic Review.*

A CASE OF BRACHIAL PLEXUS PARALYSIS.—Edmund Bechtold (*Jour. Mo. State Med. Ass'n*) exhibited a case before the Washington University Medical Society with the following history: The patient, a farm laborer, aged 39, entered the hospital complaining of "paralysis of right arm." The family history and past history are unimportant.

Present History: On Nov. 4, 1916, in an attempt to grease the belt of a machine, the patient's right sleeve was caught, carrying the hand and arm between the belt and pulley in such a manner as to cause a violent downward and external rotation of the arm; at the same time throwing the head and shoulders in opposite direction, striking head on the fly-wheel and causing immediate unconsciousness. He remained so for one hour and a half followed by delirium during which patient was told he complained of pain in forearm. The ulna was fractured and splints applied. These were removed in two weeks and plaster cast applied from below elbow to wrist and removed at the end of ten days. During his time the hand was blue and swollen. When cast was removed patient noticed there was no feeling in his hand, but from time of accident he was unable to move arm or fingers which he thought was due to ulna injury. One month after injury he was told that the trouble was due to a clot on left side of brain and that an operation here would give relief. This accordingly was done, however, with no benefit. Since then there has been a progressive wasting of the muscles of the arm and patient presented himself with the following conditions:

The neurological examination is unimportant except for right arm. There is an operative defect in the skull 5 cm. in diameter, over the frontal lobe on left side. There is a complete flaccid paralysis of the muscles of right arm, which hangs limp, including deltoid, supra and infraspinatus, pectoralis major and minor. The rhomboids and serratus anterior are intact since there is no winging of the scapula. To pin prick there is total anesthesia of the arm to above the elbow with a narrow band extending up to the shoulder on the lateral aspect. Response to cotton-wool corresponds to that of pin prick, except in several places on anterior surface, where cotton-wool is detected slightly within the area of pin prick anesthesia. Deep sensibility is completely lost over the forearm and there is no vibratory sense until elbow is reached, where it begins to be felt. Reflexes absent in right arm.

The differential diagnosis lay between a spinal root injury and a brachial plexus injury (a central lesion being excluded and there was not the deformity of Volkman's ischemic paralysis). The fact that the rhomboids and serratus anterior were active showed that the long thoracic nerve and dorsal scapular nerves were intact. The area of epicritic and protopathic sensation corresponded so closely here that little could be concluded from it; but in several places the protopathic loss was greater than the epicritic loss, which, according to Sherren, is characteristic of a root lesion. The difference between these two forms of sensation was, however, not marked enough to warrant a diagnosis of root injury, especially since the long thoracic nerve responded to the faradic current.

SEXUAL HYPOCHONDRIASIS.—By Sir J. Paget, in the *Journal of Urology and Sexology*, is a general consideration of the causes, symptoms, prognosis and treatment of sexual hypochondriasis, in which the author contends that the primary and essential element in the causation is a neuropathic diathesis; the functional and usually trivial maladies or even the normal functions ignorantly misinterpreted through reading quack literature, etc., are ordinarily the result of a preceding neurosis and are secondary elements in the vicious circle. The author enumerates a number of these local conditions, among which are: nocturnal emissions, premature ejaculations, psychic impotence and the passage of semen in the urine, the latter of which, the author states, is very rare, as it is usually mucus which the patient mistakes for semen—all of which are discussed and, together with their concomitant symptoms, are shown to be evidences of central nervous disorder and though ordinarily benign, appear grave to the potential hypochondriac who falls a prey to the ignorant or vicious mountebank or becomes a victim of quack literature.

Since the state of mind which in the neurasthenic is characterized by introspection, apprehension and worry but multiplies the source of the patient's misery, the *sine qua non* of successful treatment is psychotherapy, more especial persuasion, or the educational method, by which the patient's fears are allayed and hope inspired, thus placing him in a proper mental attitude for whatever treatment of a physical nature may be indicated.

CEREBROSPINAL MENINGITIS.—Dickson, *British Medical Journal*, reports the frequent post-mortem finding of blocking of the foramen of Magendie by fibrinopurulent exudate or the blocking of the foramina in the region of the fourth ventricle and of the whole foramen magnum through swelling of the brain substances and its congestion. Both of these conditions are often associated with purulent inflammation in the cerebral ventricles while the spinal fluid may have become almost sterile. They are of great importance in the matter of treatment since it is obvious that lumbar puncture and the intraspinal injection of serum or other agents would not relieve the intracranial pressure or allow the therapeutical agent to reach the infected brain. Puncture and direct injection of the lateral ventricles may be tried with some hope of benefit. Post-mortem experiments made by the author in cases of meningitis and in nonmeningeal cases showed that spinal intradural injections of from fifteen to thirty mils of methylene blue were followed by marked staining of the brain and the interior of the lateral ventricles, while this was largely or entirely absent in cases in which there was either of the types of blocking described. Clinical experiments with the lavage of the spinal canal with saline or the injection of eusol or of sodium citrate did not give encouraging results.—*Medical Standard.*

WAR AND NEUROSIS.—Clarence B. Farrar, *American Journal of Insanity*, in an elaborate article discusses the various factors in the causation of the war neurosis, especially the so-called traumatic neuroses of which he writes, "it is one of the striking results of the war experience, however, that prevailing opinion has shifted frankly away from the organic and towards the out-and-out functional basis of the disease."

The author quotes Buzzard as stating that during 18 months' experience in London in wards for the treatment of organic nervous cases from the front, he saw no example of hysterical manifestations such as usually constitute the condition called traumatic neurosis.

The author himself states that among scores of Canadian soldiers returning with severe head injuries, most of them shrapnel and gunshot wounds with loss of portions of the skull, symptoms of psychosis or traumatic neuroses have practically never been observed. The only fairly constant general symptoms reported have been headache and vertigo. Other symptoms have been of the projection variety dependent upon injury to particular regions of the brain.

The author considers trench neurosis under the following etiological headings:

1. Individual psychophysical constitution.
2. Exhaustion and kindred factors.
3. Specific motor-habit formation.
4. The psychogenic moment.
5. Trauma.

Individual Predisposition.—The *a priori* assumption would be that a demonstrable neurotic or psychopathic tendency, subnormal nervous resistance or stability, psychotic potential, or whatever one chooses to call the individual biological basis, is the indispensable starting-point of any outspoken neurosis. This opinion is supported by practically all observers.

In England Major Mott in his Lettsonian lectures on the "Effect of High Explosives on the Central Nervous System," observes that "a large majority of the cases of so-called shell shock admitted with functional neurosis in some form or other occurred in individuals who either had a nervous temperament or were the subjects of an acquired or inherited neuropathy."

In the war session of the German Neurological Association held in Munich, September, 1916, Gaupp gave expression to a similar view. "In the congenital psychophysical make-up of the soldier is to be sought the most important cause of neurotic disorders. The psychiatric analysis of the individual case, points to a psychopathic basis in most of the war neuroses, often indeed where the anamnesis as usually recorded reveals nothing."

Essentially the same conclusion was established by Birnbaum in his initial review of the literature on war neuroses and psychoses covering the first eight months of the war. Soldiers developing nervous and mental disorders show "in the great majority of cases a predisposition; by which is understood not only a congenital, but also an acquired disposition such as may be observed following the chronic abuse of alcohol, earlier head injuries with concussion, etc."

The Cobourg material utilized in this present report is neither large enough nor representative enough for drawing general conclusions. It may be set down simply as a matter of record that the patients who had suffered from shock symptoms, and of whom records and observation were sufficient for an approximate estimate of personality, exhibited almost without exception, certainly in more than 90 per cent., a constitutional predisposition. Most of them belonged to the schizophrenic and defective groups. Several had been alcoholic to excess.

According to Mott the basic conditions upon which symptoms of shock develop are as follows:

"(1) Inborn: (a) a timorous disposition and an anxious temperament, (b) a neuropathic or psychopathic inheritance;

"(2) Acquired: (a) a *locus minoris resistentiae* in the central nervous system in consequence of alcoholism, syphilis, or previous head injury, (b) a lowered neuropotential, the result of a post-febrile neurasthenia, (c) nervous exhaustion, the result of mental stress, anxiety, insomnia, and terrifying dreams, (d) bodily exhaustion from fatigue, cold, wet and hunger."

The question has been widely debated whether a man whose nervous and mental organization is hereditarily and individually sound will fall a victim to trench neurosis. Bearing in mind the fact that our knowledge of the transmission of mental characters is so rudimentary as to make impossible any final conclusions as to the significance of heredity in this connection, and the further fact that in any mental inventory the issue of normal or abnormal is often purely an arbitrary one, a question of degree, and that any and every one is blest or cursed with a certain psychotic potential which, under stress, may exhibit actual though ephemeral psychotic trends for which we are pleased to make allowance as physiological—it must be admitted that the discussion of the question raised is premature, or at most perhaps of purely academic interest. It is to be observed further that the military anamnesis is usually, in the very nature of things, a fairly laconic record; nor does it necessarily carry much weight when it can even affirm with reasonable authority that a given patient had always previously enjoyed good health and had not been subject to nervous symptoms. We still get histories of that sort in everyday hospital practice in well-known types of psychosis which we believe to be frankly constitutional. Moreover, in any essentially episodic psychosis or neurosis, there has to be a first time for an outspoken syndrome to develop, and the fact that in a given case no such syndrome had before appeared merely means that that first time is the present one.

Of the three ways in which etiologic factors in general operate, as (1) cumulative, (2) convergent or (3) catastrophic influences, it has long been recognized that under the third form they are particularly likely to strike apparently sound individuals and that a lesser degree of psychotic potential may be requisite for the production of psychosis when the causes are of the catastrophic sort. Such they pre-eminently are in the trenches, but they are often cumulative and convergent as well; so that it is safe to say that of all possible nervous disorders the war neurosis may conceivably appear in certain persons with a minimum of neuropathic predisposition.

We are accordingly prepared for Birnbaum's report that neuroses and psychoses resulting from the stress of warfare, have occurred in individuals "with sound heredity and previously apparently entirely normal." Nonne, who together with Gaupp and Oppenheim led the debate on the war neuroses in the Munich congress already referred to, asserts that "the war has shown that persons with previously sound (vollwertig) nervous system can acquire a neurasthenic symptom complex," and further, "assuming as the distinguishing characteristic of hysteria that emotional reactions are transformed into somatic symptoms which may long survive the exciting emotion, the war has taught that hysteria is no rarity even in persons hitherto quite healthy (vollwertig)."

So much for indivdual predisposition. It may be added that the type of personality has of course its own influence in determining trends in an eventual psychosis, and that existing psychotic states are usually, although not always, aggravated.

Regarding the importance of exhaustion in the causation of neuroses at the front there is a wide range of opinion. It is a factor extremely hard to estimate. To be kept in mind in this connection is the distinction between acute exhaustion with its somatic and psychic manifestations—a condition reproducible in the laboratory at will—and the so-called exhaustion psychoses.

He sums up the effect of war upon the nervous system in the following conclusions:

(1) Cases with gross lesions of nervous tissue, peripheral or central, present questions essentially surgical and neurological. Specific psychotic symptoms do not, as a rule, accompany them. In particular such lesions do not give rise to the so-called traumatic neuroses.

(2) Apparently any individual of sound constitution and inheritance may at the front exhibit minor, transitory neurotic symptoms which are strictly reactive and may be classed as physiologic.

(3) That the severe war neuroses may also, under certain circumstances, develop in persons apparently quite normal, has been asserted by competent observers; but the concept of normal is so elastic that a definite answer to this question may never be forthcoming.

(4) It remains true, however, that in the majority of severe war neuroses of all types there is evidence of a personal element of psychopathic potential.

(5) The factor of exhaustion may lead to collapse or to acute transitory fatigue states, and if severe and protracted, to progressive physical deterioration. War experience has not established its etiologic importance in the neuroses of psychoses.

(6) Psychic disturbances among troops may be (a) accidental, *i. e.*, such as occur in the community generally and cannot be attributed to service, and (b) reactive, those which stand in some specific relationship to the conditions of army life.

(7) The reactive group is made up essentially of psychoneuroses, which may be divided epochally into (1) anticipatory neuroses, and (2) trench neuroses.

(8) The type of the trench neuroses is the condition called "shell shock," which usually consists of a transitory concussion syndrome followed by a more or less protracted neurotic phase.

(9) Trench neuroses occur usually in unwounded soldiers. There is no satisfactory evidence that trauma plays any part in heir causation. There are well-qualified observers who hold that as a result of contemporary military experience, the concept of the so-called traumatic neuroses should be abolished.

(10) The drift of opinion is unmistakably toward the psychogenic basis of war neuroses of all types, including shell shock. Even in an initial unconsciousness or twilight state of some duration there is evidence that the psychogenic element may have as great if not greater rôle than the item of mechanical shock, although this is also important.

(11) Clinically the trench neuroses present in the main hysteric and depressive-neurasthenic syndromes or combinations thereof. In this sense, therefore, there is nothing specific or new about them.

(12) Their distinctive character resides in the fact that the precipitating causes are unique and strongly color the symptom pictures; further in the conspicuous reactive motor phenomena, and in the more or less specific ideogenic moments.

ANXIETY ABOUT THE LUMBAR PUNCTURE.—Newmark and Beerman, *Medical Record*, state that the danger attending a lumbar puncture in a case of intracranial tumor, especially when the growth is in the cerebellum, is widely known, but he holds that it should also be known that when the tumor is intraspinal the effect of the puncture may be to seriously increase the compression of the cord. This happened in an instance reported by Nonne, to such a degree that the patient became paralyzed in all four limbs, and, in spite of the immediate removal of the tumor, lost his life.

In one of the authors' cases in which there was an intradural psammoma opposite the second dorsal spinous process, the paresis of one of the lower extremities was converted into complete paralysis after they had removed about 6 c.c. of fluid.

In another case of compression of the cord by the same kind of tumor they had to answer for very severe consequences. In this case they observed that a "dry tap" may be as productive of serious results as a copious flow of fluid. The patient was a young woman who complained of a slight weakness of one foot, but she walked without conspicuous trouble and was even able to dance. One serologist having found the Wassermann reaction of the blood serum positive and another negative, and each on repeating the test adhering to his first result, a decision was sought from the spinal fluid. One of the serologists inserted the needle several times without obtaining fluid, with the patient at first in the lateral and then in the sitting posture. On the following day the girl complained of headache such as would be expected after the evacuation of the liquor; her legs, moreover, began to get weak, and in three days after the puncture there was almost complete paralysis of one lower extremity, paresis of the other, and anesthesia. They heard ominous mutterings about their having "punctured an important nerve," and with the consequent impairment of their credit found it difficult to obtain consent to an operation for the removal of a tumor which the sequel of the puncture had enabled them to diagnose and localize. Eventually the growth was removed by Dr. Harry M. Sherman and the patient recovered completely. In the light of the issue the puncture was seen in both of these tumor cases to have been advantageous to the patients, by increasing the compression of the cord and indicating more exactly the level of the lesion; the second case was "matured," so to speak, and the cure of the patient hastened, perhaps by months.

In two other instances, one of cerebrospinal syphilis and the other perhaps of multiple sclerosis, a puncture which failed to produce fluid was nevertheless followed by severe headache. In the second of these cases they learned from the patient that the puncture which had been performed several months before had caused intense pain in the back of the head for ten days; they punctured her without difficulty and withdrew about 3 c.c. of fluid, and caused her no subsequent suffering at all, so that they have the curious case of a "dry tap" occasioning much distress while a productive one was tolerated with ease.

They have done lumbar puncture when there was compression of the cord by an intradural tumor, without observing any exacerbation, and have read of many other cases in which the puncture was made with impunity. On the other hand, cases might be adduced to show that sudden, or at least rapid, aggravation may occur, unprovoked by any deed of the doctor. Hence the question may arise whether we may not be dealing with a coincidence when the lumbar puncture has seemed to precipitate a disaster.

On the contrary, they mention the case of a woman who had a hemiparesis which had come on rapidly a few days before they saw her. There were no headaches, no choked discs or other signs of pressure, and one got rather the impression of a vascular disease than a growth. After deliberating for ten days the authors determined to get what information lumbar puncture would furnish and set a morning for the little operation; but on their arrival they found that in the night violent headaches had set in, the paresis had developed into absolute paralysis and papillitis, and a slow pulse signified the acute increase of intracranial pressure. Had they been less tardy in their resolve to do the puncture, by only a few hours, there would have been no means of absolving themselves from responsibility for the woman's grave condition. Indeed, they should not have doubted it themselves, and should have been charged with it by others. The patient died a month later, and they show by reproduction of a Weigert section through both hemispheres how a large sarcoma of the thalamus may exist without those symptoms of increased pressure which might warn the doctor against doing that which he may be sorry for.—*Therapeutic Gazette.*

NEURO-THERAPY.

Modern Diagnosis and Treatment of Syphilis.—Thomas and Barnett, in an article in the *New York Medical Journal*, claim that the treatment of syphilis, notwithstanding the promise of salvarsan and its substitutes, judged from the excellent serological results, extending in many instances over several years, remains, in a sense, empirical. The ultimate proof of cure does not rest necessarily upon continuously negative Wassermann reactions for one, two, three, five, ten, twenty, or even forty years, but rather upon complete freedom from symptoms for a generation or more. The Wassermann reaction furnishes the best control of treatment and is the most reliable index of cure subsequent to proper treatment. The sheet anchor in the treatment of syphilis is no longer mercury, but salvarsan, neosalvarsan, or one of their substitutes. It is of paramount importance, however, that the injections of arsenobenzol in the beginning be administered as early as possible and intensively in full doses commensurate with the physiological tolerance of the patient, not scattered indefinitely over months, interspersed here and there with a Wassermann test. In view of the possibility of immediate cure by this drug properly administered in the primary if not the secondary and latent stages of the disease, the treatment of syphilis, particularly in the chancre period, prior to the advent of a positive Wassermann, becomes an emergency operation, in many instances no less imperative than the administration of antitoxin in diphtheria. Our experience dictates, as a reliable routine, two injections of salvarsan in the early chancre stage; at least three injections in the late primary and throughout the secondary or latent stage of the disease, and during the tertiary and hereditary forms of syphilis not fewer than four to six injections, supplemented by mercury and the iodides. If, after such treatment, the Wassermann still appears positive, a second series of injections should be administered. Serologically judged on a three-month to a five-year duration, syphilis, in the chancre stage, if diagnosed early, either clinically or if necessary by either the dark-field microscope or the Wassermann reaction, may be cured by two injections of salvarsan or neosalvarsan; indeed, if the diagnosis is made, particularly before the advent of a positive Wassermann, one dose of either of these drugs may be sufficient. Secondary syphilis seems to do just as well without as with mercury, providing enough salvarsan or neosalvarsan is given to produce a negative Wassermann. The serological result in tertiary syphilis treated intensively with salvarsan and its substitutes are not so brilliant as those of the secondary period. The French preparation of arsenobenzol and the Canadian diarsenol are excellent products and may be just as efficient as salvarsan and neosalvarsan, but on account of their greater tendency to toxic phenomena are not destined to supercede the original German products. Likewise arsenobenzol, owing to its lesser potency in the reduction of the Wassermann reaction, must be regarded as inferior to the German products. The arylarsonate "soamin" and sodium cacodylate, both clinically and serologically, have no place in the effective treatment of syphilis. Sociologically, in view of the fact that less than twelve per cent. of our hospital syphilitics return for treatment until discharged cured, a problem is presented which urgently demands the co-operation of our civil authorities and health boards for the necessary control and treatment of this disease, not, however, to be realized until all hospitals receiving state aid are compelled to maintain evening dispensaries with paid attendants for the proper treatment and admission, when necessary, of venereal patients. —*American Journal of Syphilis.*

A NEW METHOD OF INTRASPINOUS TREATMENT OF NEURAL SYPHILIS WITH MERCURY.—Maurice F. Lautman, *New York Medical Journal*, states that to saturate the patient with mercury, daily inunctions are given of one-fourth of an ounce of fifty per cent, mercurial ointment, supplemented by tri-weekly intramuscular injections of any one of the mercurial salts. These procedures are continued until the first evidences of ptyalism appear, when 30 c.c. of blood are removed by venipuncture. The rest of the technic is similar to that used in the Swift-Ellis method; the blood is allowed to clot and the 10 or 15 c.c. of serum obtained is pipetted off and centrifugated to remove all of the blood cells. One c.c. of a solution of one grain of mercury benzoate in 25 c.c. normal saline is placed in a clean test tube and boiled. If on cooling this solution becomes turbid, it should be discarded and another cubic centimeter of the solution boiled up in the same tube. If this remains clear on cooling, the clear serum is added and the preparation is mixed well. It is then heated at 56° C. for half an hour and administered by gravity, at body temperature. The method of administering the serum is essentially the same as that recommended by Swift and Ellis. The method was used in eighteen cases, though the present report contains the records of the first ten cases which completed the course of injections. The cases were unselected and embraced almost all the forms in which neural syphilis manifests itself. In all of the cases, after from three to six injections, the spinal fluid was rendered normal. The extent of the clinical improvement and the restoration to economic efficiency seem to depend upon the extent of degeneration at the time the treatment was instituted. In no case was there further deterioration during or after the treatment. Neither was there any case in which the spinal serology could not be influenced. The results in the cases treated were uniformly favorable, and there is no hesitation in recommending the method for the treatment of syphilis of the central nervous system.—*American Journal of Syphilis.*

RESULTS OF THE PSYCHIC TREATMENT OF SOME CASES OF ASTHMA.—A. Stegmann (*Zentralblatt für Psychoanalyse*) has reported in an earlier article (1908) cases of asthma in children which lead him to believe that the disease developed more from psychoneurotic factors than from a somatic basis. He now discusses some later cases of asthma which have come under his professional care. One of these was a woman aged forty-one, twice married. The malady began at thirty-six. Investigation showed that the asthmatic attacks were the result of jealousy and desire to keep her husband at home from the city. The treatment was interrupted before it could be concluded. The second case was that of a woman, aged forty-five, who had suffered from severe asthma since she was twenty-one. A real psychoanalysis could not be carried out, but the short treatment demonstrated the effect of early sexual traumata, an unfavorable attitude toward the father and later jealousy of the husband's family and his scientific activity as causative factors. The attacks were rendered much less severe and less frequent by the partial treatment. The author believes that asthma belongs in the anxiety-hysteria group.—*Psychoanalytic Review.*

INTRASPINOUS INJECTIONS OF NEOSALVARSANIZED SERUM IN NERVOUS AND MENTAL DISEASES.—Alfred Gordon, *New York Medical Journal*, claims the results obtained in 212 cases are bound to create a spirit of optimism in the management of cases with evidence of syphilis. In some cases the expectation is greater than in others, as, for example, in early cases. In some cases the amelioration of the nervous and mental manifestations are short of being considered brilliant and indeed it is apt to render one highly enthusiastic. But a calmer consideration of the actual facts, especially when the cases are followed up for a sufficiently long time, does not permit the author to be over-sanguine in spite of the favorable results obtained in the majority of cases. There were sufficient recurrences to warrant a conclusion that the last word in the treatment of nervous and mental diseases of syphilitic origin is far from having been spoken. On the other hand, a mere comparison of the results obtained from the old methods of treatment with those from the newer procedures must convince an impartial observer that the latter are much superior to the former. The largest number of the author's cases, except the psychoses, had been treated with mercurials and iodides for a considerable time prior to coming under the author's observation with slight or no traces at all. The cases in which some success had been obtained with those remedies cannot stand comparison with the cases to which the intraspinous treatment has been applied. In the latter the results have been at times so strikingly satisfactory that for the present at least it appears to be the only procedure in which hope can be placed for checking syphilitic diseases of the nervous system. A procedure that enables us to bring spirocheticidal reagents into direct contact with the cerebrospinal system, intraspinally and intracerebrally, seems to be the most logical one. The fact itself of giving satisfactory results in most serious affections is most encouraging and promising. It points the way in which our efforts should be directed. The future success lies in the perfection of this method.—*American Journal of Syphilis.*

INFANTILE PARALYSIS TREATED WITH IMMUNE SERUM.—Orlando H. Petty, *New York Medical Jour.*, writes that in deciding the value of any therapeutic agent, a much larger number must be observed than the eleven cases reported, yet with acute poliomyelitis many observers must each report their small series that a large number may be collected for a final opinion. From a study of eleven cases of acute poliomyelitis treated in private homes with immune human serum administered sub-durally, which administration caused no unfavorable symptoms, the author would draw the following conclusions:

Immune serum, to be of marked value, must be administered early in the course of the disease, in the preparalytic stage, or at least within a few hours after paralysis has developed.

There is little doubt that the subdural method of administration in this disease, as in all cases of meningeal involvement, is the most efficient. Sub-dural administration should always be by gravity, less serum in amount being introduced than the total amount of fluid withdrawn, except in those rare instances where no more than two or three mils of spinal fluid will drain through the needle, where 5 mils may be administered cautiously. A single sub-dural dose probably should not exceed ten mils, and be repeated within twenty-four hours if the case is not progressing favorably. A serum, not inactivated, from those who have had an attack not over ten years previously, would be the one of choice.—*Southern Med. Jour.*

THYROID DISEASE AND SEPTIC TONSILS.—Wm. S. Tomlin, in the *Indianapolis Medical Journal*, writes that thyroid disturbances, including typical Basedow's disease, are associated with septic tonsils so often and show in some cases such marked improvement in all the symptomatic conditions after tonsillectomy and adenectomy that the relation of cause and effect is proved as more than a suspicion. And persistent thymus with status lymphaticus has been demonstrated in so many instances as associated with the need of tonsillectomy that coincidence does not satisfactorily explain it.—*Southern Practitioner.*

THE DUCTLESS GLANDS IN CARDIOVASCULAR DISEASES AND DEMENTIA PRECOX.—Charles E. De M. Sajous (*New York Medical Jour.*), taking into account the multiplicity of factors bearing on arteriosclerosis, shows the action of the ductless glands in the production of this condition. He divides the morbid process into three types: The autolytic type, in which the pancreas plays one of the leading parts in the process. Besides governing carbohydrate metabolism, it supplies a ferment or ferments which take a direct part in the protein metabolism of the tissue cells and also in the defensive reactions within these cells, as well as in the phagocytes and bloodstream. This sensitizing process with excess of proteins as the main pathogenic agent and the presence of trypsin in the tissue cells is carried on, and the arterial lesions provoked, through the functions of the thyroid and adrenals. While there is no proof that the protein itself activates directly the trypsin zymogen in the cells, much evidence is found to show that it does so indirectly by invoking in the whole body at large a defensive reaction. The protein does this by enhancing the functions of the thyroid and adrenals beneficially up to a certain limit, harmfully when this limit is exceeded. In other words, proteins used in excess awaken a reaction having for its purpose the conversion of the harmful surplus of proteins, both in the cells and in the blood, into eliminable end products. As long as the excess is only such as to keep this protective reaction within certain bounds, no harm to the tissue cells results, even though the cellular proferment is sensitized; but if, when the protective tide is at its highest level, more proteins are added and the already sensitized cellular proferment becomes activated, it digests the cell itself, starting the destructive process or autolysis, the precursor of arteriosclerosis. Sajous found among the functions of the thyroid gland a rôle which he assimilates to that of opsonins and to autoantitoxins. In the adrenal type are the numerous cases due to excessive physical labor. Also cases due to worry, anxiety, etc., known to play a part in the etiology of arteriosclerosis, belong to the adrenal type, though merged many times into the autolytic type. The denutrition type, is shown in cases of myxedema with advanced arteriosclerosis. In the aged, arteriosclerosis is doubtless due in some instances to deficient activity and ductless glands. In cases of hypoactive adrenals the blood pressure is not always high, so it should be regarded more in the light of a very important early symptom and also as a valuable danger signal in advanced cases than as a causal factor of the disease, remembering that in some patients it is compensatory. Sajous outlines a treatment, and further states that there is sufficient evidence to show that arteriosclerosis is the result of excessive or deficient activity of certain ductless glands, the thyroid and adrenals in particular.—*Southern Practitioner.*

SYDENHAM'S CHOREA, WITH SPECIAL REFERENCE TO TREATMENT.—Daniel and Lambright, *Ohio State Medical Journal*, state that from their experience they are led to believe that the tonsils very frequently contain the source of trouble in chorea.

The greatest care as to oral hygiene should be exercised. Decayed teeth should be taken care of properly, and if there are any alveolar abscsses they should be draind.

Discharging ears are sometimes the source of trouble and should be carefully treated. In some of these cases autogenous vaccines are of service.

Sometimes it is the intestinal canal that is letting the toxins and bacteria into the system and calls for treatment. Here daily irrigations should be employed. The use of lactic acid cultures has been of value.

There is an undoubted relationship between acute rheumatism and chorea. The question naturally arises regarding the application of antirheumatic remedies in this disease. It is not difficult to understand why the results have been discouraging when we consider that the toxins and cocci are in the cerebrospinal fluid and brain tissues and realize the small amount of salicylates excreted into the cerebrospinal fluid. The combination of alkalies with the salicylates appeals to one as rational and has been shown to be of great advantage. There is a probability that they act by neutralizing the acid toxins of the bacteria.

Arsenic has been looked upon as a specific. The introduction of salvarsan into therapy brings up the question of the application of the remedy in this disease. Arsenic was used empirically as a general nerve tonic as long ago as 1780 by Alexander. Pawlow, von Bakay and Pierre Marie have used salvarsan and report favorable results. We are centainly able to get enormous doses of arsenic into the system by the use of this drug. On this account where arsenic is indicated, especially in intractable cases, its use is feasible. Milian argues that there is a luetic factor in a great many of these cases, and on this account the therapeutic results in some of them may be explained.

The symptomatic treatment is a very important part. The patient should be placed at rest with isolation from influences which tend to excite. Schoolchildren who develop chorea should be immediately withdrawn from school and about the streets. It is well not to allow a child to read or to exert its mind. Careful diet should be instituted and the bowels regulated. Toxic foci if located should, of course, be removed before this treatment is instituted. For the motor restlessness hydrotherapy offers the best results. Occasionally chloral, bromides, hyoscyamus, or small doses of morphine are demanded in the severe cases.

Recently Mayer has reported a series of cases in which he injected a small amount of one per cent. phenol solution intravenously. The results according to his report have been good. This is a new treatment and it is too early to judge of its efficacy.

We must always keep in mind that in a large majority of cases there is a myocardial involvement. The great damage that may be done by overexertion is well known.

Suffice it to say that prolonged rest with ice bag to chest should be insisted upon. Whenever there are signs of cardiac decompensation the routine treatment for that condition should be carried out.

Poynton and Payne recently issued instructions which should be given to parents of rheumatic children which might well be applied to cover chorea. The instructions are as follows:

1. The importance of proper clothing.
2. The care of sore throats.
3. The necessity of attention to growing pains.
4. That nervousness, clumsiness, and night terrors are often warnings of chorea.
5. That patients should be warned that signs of heart disease are few, and that shortness of breath is by far more common than pain.
6. Much emphasis should be laid on the need for patience when the child is recovering from this disease.
7. Parents should be told that rheumatism and chorea are liable to recur.—*Therapeutic Gazette.*

ALCOHOLISM IN RELATION TO EPILEPTOID STATES AND EPILEPSY.—Gordon (*Medical Record*) calls attention to the various types of epilepsy associated with alcoholism. He describes cramp-like attacks occurring in different muscles such as the calf muscles, similar to what is observed in saturnism and ergotism. He also mentions vertiginous attacks asociated with chronic alcoholic intoxication, and believes they are mild atypical epileptic seizures. The various psychic states of a sudden onset (epileptic equivalents) may occur. These are usually of an explosive character, have a sudden disturbance of consciousness and amnesia. They may vary from a simple acute irritability to short periods of double personality, characterized by the brevity of the duration and the patient's behavior during the attack. True attacks of epilepsy proper may develop. There are two main groups, in one where the alcohol is simply an additional factor and increases the number and severity of the convulsions in a true epileptic; in the second group, where the alcohol is the sole factor in the production of the epileptic attack. Those which are due directly to chronic alcoholism may be divided into several classes. In one class, the convulsion occurs after an excess of drink and is probably due to temporary congestion of the cerebrum. In another class, epilepsy develops, after many years of alcoholic excess, usually between the age of 40 and 55. This is the most serious form of alcoholic epilepsy and is probably due to the sequelae of meningo-encephalitis, associated with chronic degenerative changes. In a third class, the epileptic attacks occur when the patient is suddenly deprived of his habitual dose of alcohol. The frequency of epilepsy in alcoholics varies from 11 per cent., according to Magnan, to 46 per cent., according to Stepanoff. The author reports several interesting cases of the various types.—*St. Paul Medical Journal.*

TREATMENT OF HYPERTHYROIDISM.—Gries, *American Journal of Roentgenology*, does not believe it advisable to hasten the Roentgen ray treatment of exophthalmic goitre. The massive dose method of treatment is especially dangerous in the acute type. The first improvement noted is in the nervousness and the pulse rate. This is followed by an increase in the weight and an improvement in the other symptoms. Formerly gas tubes were used; now the Coolidge tube is used. The mild cases of hyperthyroidism may be treated medically by the Roentgen rays. In acute exophthalmic goitre Roentgen treatment is the most satisfactory. In chronic exophthalmic goitre the choice lies equally between roentgenization and operation. The Roentgen treatment is slower, but there is not so much danger in producing a subsequent hypothyroidism as by operation. The death rate from x-ray treatment is nil. Where hyperthyroidism develops in an old goitre Roentgen treatment is only palliative. Here the danger of producing myxedema is also greater and the treatment should be surgical.—*Medical Standard.*

A PLEA FOR THE TABETIC.—Grossman, *Interstate Medical Journal*, lucidly explains the reason for this class of sufferers falling readily into the hands of irregular practitioners. It is because of the common tendency of the American profession when they diagnose a case of lumbar ataxia to give prompt and unfavorable prognosis and to dismiss the patient with a few words of gloomy advice and perfunctory pity. Such a patient is subject to tremendous influence through his psychic state, and hence may be benefited and greatly benefited by one or many forms of treatment which in themselves have little or no effect. Moreover, such treatment may come at a time when the patient is subject to one of those remissions so common in all chronic infections. Nor can it be doubted that the ablation of the toxic focus is at times so markedly helpful to the tabetic as to amount almost to a cure. The treatment considered is first that directed against the apparent cause of the disease, and second, that directed against its symptoms. Medicinal treatment directed against any active luetic process, the combined use of salvarsan intravenously and the salicylate of mercury intramuscularly, has proved to be the method giving the best results; 0.2 to 0.4 grm. of salvarsan should be injected intravenously at intervals of from seven to ten days for six injections; in the intervals injections of mercury may be given, they being continued for ten weeks after stopping the salvarsan. The salicylate is given in doses of one-half to one grain twice a week. After one month's rest the same process should be repeated until the activity of the disease as indicated clinically and by biological reaction is arrested. Intraspinal injections of mercurials and salvarsanized serum seemed to be distinctly serviceable, though it has been shown that the spinal fluid twenty-four hours after the intravenous injection of salvarsan contains more arsenic than it does immediately or shortly after the injection of the so-called salvarsanized serum. In the dose of the latter but 0.0001 grm. of salvarsan is found.

As to symptomatic treatment, pain is one of the most common and distressing symptoms of tabes. It may last minutes, hours, or days, and may be of almost unbearable intensity. It is usually in evidence when there is excessive humidity in the air or lowered barometric state. Local measures should be used, such as dry heat, cauterization, massage, tight bandages, etc. Aspirin, antipyrin, salicylate of soda, and codeine are the most efficient of the milder drugs. As a last resort morphine may be needful. It should be used with extreme caution and as a rule without the knowledge of the patient. Bladder disturbances, which occur in about 80 per cent. of cases and which consist of dysuria, hyperesthesia of the neck of the bladder, followed by frequent micturition, dribbling, and various degrees of retention, may be helped by strychnine and ergot in small doses. Of the utmost importance is the training derived from emptying the bladder at short intervals, at most every four hours. A danger that must not be underestimated is that of infection. A catheter must be used in a thoroughly cleanly manner. The ataxia present in about 75 per cent. of the cases begins insidiously in the lower extremities, often by tiredness and unsteadiness, with a tendency to stumble easily, especially in the dark. Frenkel elaborated a system of exercises so designed as to reeducate the ataxic muscles by a graded coordinated movement. The patient is trained at first to stand and to use his eyesight to compensate for the loss of his joint and muscle sense. Simple training movements are then added, such as touching with the toe a figure marked upon the floor, later walking movements in which the patient attempts to follow accurately a series of footprints, marked at various distances upon the floor. Later walking movements in which the patient attempts to follow accurately a snake-like course, turning, etc. Finally walking up and down stairs is taught There are few patients who have not improved to some extent, and a few are so much better that they can walk unattended in public. Relapses are common. Maloney's method is based upon first the teaching of coordinated movements blindfolded; second, the correction of the mechanical defects usually found in all tabetic feet; third, the treatment and elimination of the psychic components of ataxia, the principal one of which is fear.

Maloney's method is thus applied: Mechanical measures; these consist of plates, shoes, and knee-caps, by means of which we endeavor to correct any mechanical disabilities present. Casts of the foot at rest and when bearing the body weight are taken, and a suitable plate to correct defects of the arches is constructed therefrom. The type of plate used is a modification of the Whitman plate, the inner lip being curved below the level of the scaphoid; the outer flange is lower and does not extend so far forward; and the support of the transverse arch extends outward beneath the four inner toes. When the spread is great, the inner lip extends forward to include the metatarsophalangeal joint, surrounding it completely on the inner side.

A high shoe, especially strengthened on the outer side of the ankle, increases the support of the ankle and prevents the foot from turning in. The heel is low and wedge-shaped, the base of the wedge being on the ground, and is continued along the outer side of the shoe. A welt, as broad as the patient will permit (usually about a quarter of an inch), projects. A wooden shank is placed in the sole to prevent bending. The shoe should be as light as is consistent with maintaining its shape. When the shoe is on the ground, it rests on its whole bearing surface. The patient gets support from this broadened surface simultaneously. He does not oscillate every time he puts his foot down. He feels more secure; he really is more secure. He is readily weaned from the straddle-legged attitude, which is so disconcerting to coordinated walking. The occasional giving at the knees has a very demoralizing effect upon the ataxics. To avoid this giving, the knees should be lightly supported by an elastic bandage.

The educational exercises are coordinated movements and balancing. The breathing exercises are carried out by putting the patient blindfolded upon a bed, directing him to inspire deeply, using his diaphragm and restricting his thoracic movements. At the height of inspiration he is asked to pause, then slowly and evenly to expire to the fullest extent and again pause. A small sand-bag is placed upon the abdomen. After six or eight deep breaths have been taken the patient is asked to take about the same number, but not quite so deep, shortening the pause, then slowly and evenly to expire to the fullest extent and again pause. After this medium breathing is mastered, the depth of the respirations is further decreased, and the pause is shortened until the patient is breathing quietly and regularly as if asleep.

To relax the muscles, passive movements in which the muscles are alternately lengthened and shortened are employed. The muscles of the scalp, forehead, eyelids, cheek and jaw are first passively moved until wrinkling and blinking of the eyelids diminish and disappear and muscular spasm is reduced or eliminated. Next the shoulder is relaxed, then an arm; each in turn must be passively moved until all traces of muscular tension vanish and the part lies motionless and flaccid, and falls limply from any unsupported position.

From these relaxation exercises, practiced blindfolded, three results are obtained: First, ineffective, often useless and sometimes completely disconcerting muscular contractions which have been acquired in attempts to balance are eliminated, so that the coordinating exercises can be begun on an unconstrained musculature and not superimposed upon existing habit contractions. Second, active relaxation confers a great training in attending to muscular sense impressions. Third, the patient becomes less fearful and more receptive, because in so far as fear is maintained by its motor expressions in his attitude, it is diminished.

Movements are next begun. Passive flexion and extension of the ankles are first practiced. The foot is placed in extreme flexion, and the patient is instructed to count slowly while the physician, at a uniform rate, moves the foot to a position of complete extension. The purpose of the passive movements is to teach the correct direction and extent of each movement.

Next the patient lightly but steadily resists the passive movement. Then the movement is practiced, with the patient performing and the physician aiding and guiding. The physician's aid is gradually lessened as improvement occurs, and then the movement is executed by the patient alone; finally, the movement is made against resistance. It is essential that the movement should always be completed by the return of the limb to the position from which the movement started. During every movement the patient counts rhythmically. The purpose of the counting is to educate the patient to move easily and uniformly, and at a regular tempo. After the ankle, first the knee, then the hip of the same limb are educated. Besides flexion and extension. all the simple movements which can take place at the joint are practiced. All exercises are done without shoes; artificial aid should not be employed during the exercises. In every case, first breathing and relaxation, next passive, then passive resistance, then passive combined with active, then active unaided, and finally active resisted movements are practiced.

When the ankle movements have been acquired, then movement exercises are begun with the knee; when the knee movements have also been acquired, then ankle and knee movements are repeated before each attempt at hip movement, etc.

The repetition, after relaxation exercises, of a movement which can be proficiently performed, is a great aid in the learning of the next movement. The limb movements which are practiced in the recumbent posture may also, if possible, be practiced as occasion permits in the sitting posture. From the right lower limb we proceed to the left, breathing and relaxation; passive, resisted passive, combined passive and active, active and active resisted movements at each point are practiced as before. Before any attempt is made to teach progression, the trunk muscles must first be coordinated by relaxation and movement. This is usually easy, for the upper limbs seldom being ataxic may be used to practice lateral and forward thrusts, elevation to a sitting and resumption of the recumbent posture, with aid and against resistance. The head and neck muscles are similarly treated. Their treatment is just as important as that of any other part. The position of the head largely governs the attitude of the body. Too great stress cannot be laid on this preliminary training and attitude. The whole body must be taught to move harmoniously.

The first essential of stability in walking is stability at rest. After the exercises in recumbent and sitting postures are completed, the first attempt at progression is made. Knee-caps similar to those used by carpenters, but well padded, are tied on the knees and the patient is instructed in creeping. The change from recumbent to creeping posture does not unduly strain the patient's confidence in his powers of unaided blindfolded progression. The creeping movements are conducted with the back as horizontal as possible; squatting must not be permitted. The tempo of the movement is again carefully regulated by counting. The direction is insured by means of a strip of carpet or linoleum upon which the creeping is performed.

After creeping has been practiced for some time, first changing from creeping posture to kneeling up, then rising from the sitting posture to the upright, are attempted. In the erect kneeling posture, progression is practiced. Progression in the creeping and kneeling postures trains a person to move his body automatically with his lower limbs.

This training is invaluable as an aid to walking. Finally walking is taught. To maintain direction during blindfolded walking, strips of carpet or linoleum are again used.

These strips may be arranged parallel with the walls of the room, so that the patient may at first feel his way. As he becomes more proficient, narrower strips are used until he is able to progress on a strip five inches wide. Relaxation should be as zealously practiced as are the movements, as in the beginning the education of muscular sense impressions must come mainly through these exercises reenforced by blindfolding and passive movement. The patient should be exhorted not only to relax daily at definite periods, but also to avail himself of every opportunity of relaxation. Every movement must be performed without strain. When during the exercises the performance is unsatisfactory, the indication is relaxation. At no time should the patient be allowed to become fatigued.—*Therapeutic Gazette.*

NEURO-DIAGNOSIS.

Diagnosis of Syphilis of the Nervous System.—Edward Livingston Hunt, *Medical Record*, says that to make a thorough and reliable diagnosis in syphilis of the nervous system necessitates six things: (1) A knowledge of certain facts, (2) a clinical examination, (3) a blood examination, (4) a lumbar puncture, (5) an x-ray picture, and (6) common sense. A few of the facts that should be known are that syphilis of the nervous system occurs much oftener than is suspected; that in syphilis of the brain no typical picture is evident, and that tabes and paresis are now recognized as the direct results of syphilis. In the clinical examination there are no very new developments. Great care must be exercised upon the part of the clinician, and great emphasis placed upon the evidence obtained from the examination of the heart and circulation. In syphilis of the nervous system, an aortic insufficiency, a dilated aorta and high blood pressure are almost as common as sluggish pupils and abnormal reflexes. In tabes, Swift teaches that squeezing of the Achilles tendon will produce great pain, and in the same disease it has been known that absence of the Achilles jerk precedes the loss of the knee jerk. In the blood examination, the one factor is the Wassermann test. It is, however, neither the only nor the final arbiter. A few points to remember are: That a negative Wassermann reaction in the blood often accompanies a positive Wassermann reaction in the spinal fluid; that the Wassermann is a quantitative test and should be reported in its various dilutions; that laboratories vary, due to the difference in technic employed; that the ingestion of considerable quantities of alcohol by the patient within twenty-four hours of taking his blood may change a positive into a negative reaction; and finally, that the Wassermann reaction itself varies widely from day to day. The practitioner who deems the lumbar puncture superfluous, or too painful, is wrong. He is falling behind, and, instead of saving, he is injuring his patient. The colloidal gold test should be required in every laboratory test. It is daily increasing in value and importance. The x-ray pictures the chest; it is more reliable and more accurate than percussion in both diagnosis and prognosis. It should never be omitted and will often reveal a hitherto unthought of aneurysm or aortitis. Common sense is the last of the six factors which is deemed necessary in making a thorough and reliable diagnosis in syphilis of the nervous system.—*American Journal of Syphilis.*

THE FOUR PLUS WASSERMANN.—D. M. Kaplan, *New York Medical Journal*, writes that one must regard with suspicion a positive result in patients with an hepatic disturbance, as some liver diseases where lues can be excluded, show a positive reaction in the serum. To give only brief mention of the conditions that at times gives a plus Wassermann with lues satisfactorily excluded: We have certain forms of lepra, certain malaria, scleroderma, certain forms of scarlet fever, and of late the study of internal secretions tend to show that certain endocrine types may give a positive result without giving in the anamnesis a hint of lues (Pseudo-Tabes Pituitaria, Oppenheim). Such patients do not improve under the specific treatments and must be studied on endocrine lines. Carcinoma may give a positive reaction, particularly when the hepatic apparatus is involved. Achylia gastrica without lues may give rise to a nonspecific plus. Diabetes with acidosis gives at times a plus result. We need not go into the many tropical diseases that furnish a nonspecific result; the conditions enumerated and many others still to be observed compel attention and require great care and greater sacrifice on the part of the doctor who sees in the report a possible nonspecific Wassermann.—*American Journal of Syphilis.*

THE PRESSURE SIGNS OF CERTAIN INTRACRANIAL CONDITIONS OBSERVABLE IN THE FUNDUS OF THE EYE.—William Sharpe (*Arch. Ophth.*), lays great stress upon the ophthalmoscopical findings in a suspected case of intracranial pressure from whatever cause. When there is observed a blurring or edema of the margin on the nasal half of the optic disc it is very important to record by means of a spinal mercurial manometer the pressure of the cerebrospinal fluid lest a pseudo-neuritis be diagnosed as a papillitis.

In the opinion of the author, it is rare in cases of brain tumor that a 'choked disc' occurs unless the growth is of large size, or it causes blockage of the ventricles producing internal hydrocephalus such as the posterior mid-brain tumors, subtentorial tumors and cysts. Therefore, the early evidences of papillary involvement if recognized by the physician and the proper surgical treatment instituted will, in all probability, avoid impaired vision if not total amaurosis.

In brain abscess there is a replacement and substitution of brain tissue by purulent detritus. Consequently, it is rare that signs of intracranial pressure are manifested unless the ventricles are blocked, or a toxic and infective meningitis occurs from the presence of the abscess. The latter is of frequent occurrence in subtentorial and cerebellar abscess, but in temporosphenoidal abscess fundus changes are rare even though the purulent mass reach the size of an orange or larger.

'Choked discs' rarely are a consequence of intracranial hemorrhage and edema following fracture of the skull. In many cases of traumatic intracranial hemorrhage and edema in the absence of marked shock, the intracranial pressure rises most rapidly, so that the compensatory mechanism of the medulla has little time to adjust its vasomotor and respiratory centers to this increased pressure, with a result that death ensues before the development of 'choked discs' is possible. The author contends that if there are definite signs of marked increase of the intracranial pressure, such as an edematous blurring of the optic discs and twice the normal pressure of the cerebrospinal fluid with the medullary compression sign of a lowered pulse rate, an early decompression operation is imperative lest the patient reach the dangerous stage of extreme medullary compression, edema and even collapse of the medulla itself.

In selected cases of cerebral spastic paralysis in children due to a hemorrhage at birth, the ophthalmoscopic examination is of very great importance in aiding the differentiation of this form of intracranial lesion from other causes of cerebral spastic paralysis, namely, a lack of development of the cerebral cortex or its pyramidal tracts, or a meningitis and meningo-encephalitis following infectious diseases. If upon ophthalmoscopical examination the retinal veins are found dilated, accompanied by edematous blurring of the optic discs together with an increased pressure of the cerebrospinal fluid as shown by the spinal mercurial manometer, the diagnosis should offer no difficulty. Obviously, lack of development of cerebral tissues or cases surviving a meningo-encephalitis will not result in an increase of intracranial pressure.

Internal hydrocephalus produces blockage of the cerebrospinal fluid in the ventricles, resulting in a high intracranial pressure which almost invariably produces 'choked disc.' On the contrary, the external type of hydrocephalus arising from the damming back of cerebrospinal fluid from the general cerebrospinal canal rarely causes a measurable papillary edema.—*St. Paul Medical Journal.*

EYE SYMPTOMS IN SKULL FRACTURE.—Martin Cohen, *American Journal of Surgery*, says that the eye manifestations following fractured skull may be regarded as due, in a general way, to one or more of the following morbid conditions: cerebral hemorrhages, direct or by contrecoup, laceration of brain tissue, orbital hemorrhages, increased intracranial pressure, and possibly osseus compression or simple severing of the optic nerve. The manifestations may be divided into pupillary and fundal.

Pupillary findings: Normal, unequal, bilateral, dilatation, bilateral contraction.

Fundus findings: Mild papillitis, moderate papillitis, retinal hemorrhages, unilateral primary optic atrophy, changes antedating the trauma.

Unlike other observations, he has never observed, during a service at the Harlem Hospital for the past five years, where they average 75 cases of fractured skull annually, a single case of choked disc—that is, an evident elevation of the papilla. This condition requires time for development, and in fatal cases death occurs too early for its manifestation, while in the recovered cases it never occurs.

In the material under consideration, inequality of the pupils (in the recovered cases) was noted three times. This condition in the dilated pupil was associated with absence of the direct and indirect light reaction, while in the other pupil the direct reaction is normal, and the indirect reaction is absent. In the dilated side, in these cases, the fundus remained normal only in the early stage of the condition. One of the cases was associated with an immediate unilateral amblyopia, while the other two were accompanied by an immediate unilateral amaurosis. Such cases are important from a visual and medico-legal standpoint, and possibly also from the point of surgical intervention, provided that x-ray establishes the presence of bone displacement; but up to the present time this point has not been verified. Inequality of pupils producing a unilateral traumatic dilatation without any apparent optic nerve involvement may also be present in cases terminating fatally, autopsy in such cases showing cortical hemorrhages, ruptured meningeal artery, lacerated brain tissue, hemorrhage into the sheath of the optic nerve, local subdural basal hemorrhages around the optic canal, local hemorrhages appear into the retro-orbital tissues, hemorrhages in accessory issues, and fracture of the skull, but without any bone displacement around the optic canal.

The question arises whether this pupillary dilatation can be explained by the existence of cortical centers for visual motor impulses, such centers having been injured by the bone compression, cerebral hemorrhage, or lacerated brain tissue.

The general and local symptoms of fractured skull are too well known to need recapitulation. Since in many fractures that cause eye manifestations the lesions occur or radiate in close proximity to the eye, we often see subconjunctival swelling, chemosis, hemorrhage into the lid, which are not due to direct violence to the eyeball but rather to direct extension from the retro-orbital hemorrhage.

There is naturally great difficulty in conducting an ophthalmological examination soon after the injury, but pupillary conditions are readily noted. These are frequently normal. As soon as the patient recovers consciousness and ability to orientate himself, his visual acuity may be determined by subjective tests. Cases differ very much in this respect. In one type, the acuteness of vision is at once markedly diminished on one or both sides, even to complete blindness. Thus, after a brief period of coma, the patient may find himself blind in one eye; if an ophthalmoscopic examination can be made at this time, the fundus will probably present nothing unusual. In the type of cases in which unilateral optic atrophy gradually develops, visual disturbances usually appear within a few days to a few weeks after the injury. This condition is not perceived by some patients at first, owing to the fact that the disturbance is unilateral. The amblyopia and the amaurosis are due to interference with the conductivity of impulses affecting directly the visual and pupillary fibers of the optic nerve. Perimetric examinations will eventually show various restrictions of the visual fields.

In another class of cases, there are relatively slight visual disturbances after the injury, which are readily explained by slight fundal alterations. In this class, the damaged vision naturally improves, and there usually results a complete restoration of vision.

Since a very large proportion of cases of fractured base end fatally, we can observe the course of the ocular disturbances only in the relatively mild cases. Generally speaking, those that recover are likely to suffer from temporary or permanent visual disturbances, one of the most conspicuous results being unilateral amaurosis or amblyopia. A papillitis appearing a few days or weeks after the accident might indicate the onset of a meningitis, as we have been able to demonstrate by autopsy in three cases.

As regards vision, the cases which show unequal pupils, with no response to direct or indirect light reaction in the dilated pupil, and accompanied by unilateral optic atrophy, result inevitably in a marked permanent deterioration of the vision. Later, the dilated pupil undergoes a slight secondary contraction. In all other cases, whether or not there are pupillary or fundal changes, there is apparently ultimate restoration of normal vision, the fundus becoming normal.

The only macroscopical autopsy findings in the visual apparatus consisted of hemorrhages in the vicinity of the optic foramen, hemorrhages into the accessory sinuses, fracture in the vicinity of the optic canal, and retro-orbital hemorrhages. In cases of unilateral optic atrophy—all in survivors—we naturally have no anatomical findings, hence we have no absolute data relative to the cause of this lesion. If it could be shown by the x-ray that optic atrophy is produced by displacement of bone pressing upon the optic nerve, posterior to the entrance of the central retinal vessels, or possibly hematoma of the orbital part of the optic nerve sheath, surgical intervention might be considered as a means of preventing amaurosis. Garach notes the relatively frequent occurrence of hematoma of the sheath of the optic nerve, only to conclude that it plays no rôle in causing unilateral optic atrophy. A microscopic study of tissues of the visual apparatus is now being made and will be reported later.

There were seventy-five cases of fractured skull studied for this report; twenty-four ended fatally. The cause of death in all but three was cerebral hemorrhage. death occurring from a few hours to a few days after the injury. The other three deaths were due to meningitis—two died on the sixth day, and one a month after the fracture occurred.

Pupillary findings in 24 fatal cases:

Normal	6	
Unequal	15	
Dilated	3	24

Light reaction was absent in the majority of cases.

Fundal findings in 24 fatal cases:

Normal	8	
Neuro-retinitis	3	
Mild papillitis (bilateral)	3	
Mild papillitis (unilateral)	1	
Moderate papillitis	1	
Retinal hemorrhages	2	
Chronic chorio-retinitis	1	
No examination	5	24

Pupillary findings in 51 non-fatal cases:

Normal	44	
Unequal	4	
Not noted	3	51

Light reaction was sluggish in the majority of cases.

Fundal findings in 51 non-fatal cases:

Normal	35	
Unilateral primary atrophy	3	
Mild papillitis	6	
Not noted	7	51

Conclusions.

1. Inequality of the pupils with absence of light reflex is very common in fatal cases of fractured skull, while comparatively rare in the cases that recover.
2. Where there is inequality of the pupils associated with unilateral amblyopia or amaurosis in the dilated papillary eye, one must recognize the subsequent possibility in this eye of a resulting descending primary optic atrophy.
3. Lesions of the fundus are relatively infrequent, especially in the recovered cases.
4. Papillitis usually indicates the presence of a meningitis, an increase in the cerebral pressure, or possibly the result of hemorrhage into the sheath of the optic nerve.
5. Contrary to the usual observations, choked disc was not observed in any of these cases.
6. The presence of a unilateral optic atrophy should lead to the investigation of a possible previous head injury, if all other causes are excluded.
7. In the cases terminating fatally, the pupil was generally dilated on the same side as the corresponding cerebral hemorrhage, without showing any autopsy evidence of bone displacement on the optic nerve.
8. Fundus examination immediately following skull injuries may be helpful from a medico-legal point of view, as it may give evidence of the pre-existence of contributory factors.—*Medical Standard.*

WASSERMANN PARADOXUS.—D. M. Kaplan, *New York Medical Journal*, claims that in using two antigens one finds that the cholesterinized extract is usually the one that gives a more complete inhibition than the crude alcoholic nonreinforced product. It is by no means a rare occurrence to have complete hemolysis with the latter and equally strong inhibition with the former. Upon a closer analysis from the clinical point of view a very interesting situation disclosed itself. This paradox Wassermann invariably came from patients who displayed one or more manifestations of motor unrest, such as spasms, tics, tetanoid movements, fainting spells, and convulsions. Many presented that type of epilepsy that still parades under the designation of "idiopathic." All of them showed no signs of lues in their physical analysis or in their history. A few cases were given the benefit of the doubt, but neither mercury or salvarsan nor the combined treatment showed any improvement in these cases. The Wassermann paradoxus should always be guarded against, as it may cause trouble when only nonreinforced extracts are used. The situation has nothing to do with lues, but rather with a neural state that permits a deviation of the complement in the absence of cholesterin.—*American Journal of Syphilis.*

A STUDY OF THE CEREBROSPINAL FLUID IN CEREBROSPINAL SYPHILIS.—Charles Clyde Sutter, *New York State Journal of Medicine*, gives his observations of an analysis of fifty cases of syphilis of the central nervous system. There were ten cases of cerebrospinal syphilis, eleven cases of tabes dorsalis, twenty cases of general paresis and nine cases of tabo-paresis. The signs and symptoms of cerebrospinal syphilis are quite manifold and varied. In the cerebrospinal fluid we find a more constant picture. Almost every case shows a strong globulin reaction, a positive gold chlorid reaction and a positive Wassermann reaction. In the eleven cases of tabes dorsalis most of the examinations were made after the patient had been given considerable treatment. This alters the findings somewhat. The globulin reaction was present in seven cases, weakly positive in two, and negative in two out of the eleven cases. The cell count was increased in eight, normal in one, and borderline in two cases. The highest count was fifty-five. The Lange gold chlorid reaction in the series of eleven cases did not show any characteristic curve. The Wassermann reaction was positive in the spinal fluid in five cases and in the blood in seven cases. In one case it was negative in the spinal fluid and positive in the blood. The strongest and most characteristic reactions were seen in the twenty cases of paresis. All cases showed well-marked color changes in the Lange colloidal gold chlorid reaction. The typical paresis curve was seen in all the tests. The highest cell count was fifty. It was normal in two cases and only a slight increase in another. The globulin was positive in sixteen cases, weak in two, and negative in two cases. The Wassermann reaction was positive in every case except two. In all cases of tabo-paresis all the tests were positive; the cell count varied from two to seventy; the globulin was strongly positive in all but one case. In the light of our present knowledge, lumbar puncture with cerebrospinal fluid examinations is demanded in all cases of syphilis.—*American Journal of Syphilis.*

THE SIGNIFICANCE OF XANTHOCROMIA OF THE CEREBROSPINAL FLUID.—Sprunt and Walker, *Johns Hopkins Hospital Bulletin,* observe that they have called attention to the clear, yellow spinal fluids occasionally observed at lumbar puncture. Their remarks are based on five cases observed and reported, and an analysis of 100 cases from the literature.

The fluids may be divided into two main groups:

Those in which the color is due to dissolved hemoglobin or its derivatives, and which as a rule do not coagulate spontaneously and contain only a small amount of globulin. Such fluids usually are associated with brain tumors in contact with the meninges or ventricles.

The larger and more important group comprises those cases showing the so-called Froin's syndrome, in which the fluid is transparently clear, yellow, coagulates spontaneously, contains large amounts of globulin, may or may not show pleocytosis, and gives no positive tests for hemoglobin.

This is a "compression syndrome," its main determinants being the isolation of a lumbar cul-de-sac, in which the spinal fluid stagnates, and probably some vascular changes within its walls.

Clinically, with negative x-ray of the vertebral column, it is strongly suggestive of a tumor of the spinal cord, although it may also be associated with intradural inflammatory processes.—*Therapeutic Gazette.*

PSYCHOLOGY.

PSYCHOLOGY OF ANIMISM.—Carbeth Read, *British Journal of Psychology*, draws a distinction between two types of animism. One significance is to denote the proneness of people of unscientific culture to explain various natural occurrences as due to the action of spirits. This he calls hyperphysical animism. The other is the usage of animism to denote a supposed attitude of savages and children which attributes to everything a consciousness like our own and regards the actions and reactions of natural objects as voluntary and purposive. This he calls psychological animism. He calls attention to the incompleteness of the illusion in psychological animism. "When myth making" and in rites savages may speak and act in the full sense that the objects dealt with are sensitive intelligent beings, though their conduct towards them is entirely effective. They may preserve elaborate rituals in growing and cooking rice, but they cook and eat it just the same. Their animistic attitude, therefore, is not primitive, spontaneous, necessary illusion, but an acquired specialized way of imagining and dealing with certain things. Were it not possible to combine in this way the imaginative and the practical, all wizardry and priestcraft would be nothing but the sheer cheating it often seems to superficial observers. One must bear in mind several modes of belief about animism: (1) that things have or are possessed by a conscious spirit and that this spirit is a separable entity; (2) that things are themselves conscious, but their consciousness is not a separable entity; (3) that things are not conscious but are informed (pervaded?) by a separable essence, usually called soul (better, soul-stuff) which may be eaten by spirits or may go to ghost-land with them; (4) the extension or limitation of these beliefs to more or fewer classes of things. For example, when a people break objects above a grave or bury them in it the objects must be supposed to have soul-stuff, but on the other hand, there is evidence that the same people do not regard these objects as conscious beings. It appears most probable that savages distinguish between themselves and certain animals on the one hand, and, on the other, the remaining animals, plants and inanimate things; and raise the second class to the rank of the first, as conscious agents, only when there are special incentives to do so. Some of these he enumerates as (a) its use as a totem, (b) things that seem to move or act spontaneously, (c) whatever is regarded as having magical force, (d) whatever is much used in ritual. The most probable origin of hyperphysical animism is the belief in human ghosts, derived especially from dreams. Some savages distinguish certain dreams which are revelations and others which are mere fancies. He feels that the extension of the ghost theory to animals is easier to understand than the irregular limitations which beset it. Various classes of animals develop ghosts; animals that occasion widespread fear, animals that come to be in special intimacy, animals slain at funeral feasts, animals that are important prey to a hunting tribe. He comments on the distinction between ghosts which are associated with some definite material body, and spirits which are not so associated. There are various ways in which what was formerly a ghost may become a pure spirit. It is only in a late age, that the notion of incorporeal spirit is freed from physical qualifications, partially and amongst a few people. Originally a ghost or spirit can act physically just as a man can, because he has the same organs, but with greater power because mysterious and more feared. Some tribes believe that a man has a multiplicity of souls, thus the Dakotas believe in one that dies with the body, one that remains with or near it, one that accounts for its deeds, and at death goes to the spirit world, and one that lingers with a small bundle of the deceased's hair, which is kept by relatives until they can throw it into an enemy's country to become a roving, hostile demon. It becomes necessary for men to defend themselves against the power of the ghosts. Some peoples abandon the dying and even their villages and crops along with them. When it becomes inconvenient to do this, beliefs develop in the efficacy of beating the air with boughs of firebrands, breaking the corpse's legs, or placing around the grave loaded "ghost-shooters" (straws filled with gunpowder). Economy may also induce the belief that ghosts are easily deceived, as in the widespread practice of carrying a corpse out of his house through a hole in the wall, trusting that the hole having been immediately repaired the ghost can never find its way back. In one tribe a very large eel being taken for a ghost, no one might drink at the stream except one pool, "which for convenience is considered not to be sacred." *A conflicting desire creates a limiting belief.* In general it may be said that, allowing for the influences of geographical conditions and tradition and foreign intercourse, the chief cause of the evolution of a spirit-world is the political evolution of those who believe in it; so that the patriarchies, aristocracies, monarchies and despotisms of this world are reflected in heaven. Tribes of the lowest culture—some African Pygmies, Fuegians, Malfulu, Semangs, Veddas—have the least animism; at successive grades—Australians, Melanesians, Congolese, Amerinds, Polynesians—animism increases and grows more systematic; and it culminates in the barbaric civilizations of Egypt, Babylonia, Peru. Religion arises with the differentiation of superior beings, heroic, ancestral or other gods from common ghosts. Carried to its limit, this becomes one cause of the dissolution of animism; for the power that comprehends all powers ceases to be an object and becomes immanence of all things, good and evil.—*The Psychoanalytical Review.*

NEURO-SURGERY.

NEUROTIZATION OF PARALYZED MUSCLES BY IMPLANTATION OF MOTOR NERVES.—John C. A. Gerster and W. C. Cunningham, *Medical Record*, briefly describe the work of a number of operators and experimenters, namely Gersuny, Heinecke and Erlacher of Europe and Steindler and Elsberg of this country, who found that a muscle which has been recently paralyzed by severing its motor nerve, may be made to functionate by being placed in intimate contact with normal innervated muscle or by the implantation of a motor nerve; and report the results of experiments which they have been conducting on innervation (neurotization of muscles), as follows: The gluteal hamstring group of muscles was deprived of its motor nerve supply. The anterior tibial nerve was divided close to the knee and then implanted into the paralyzed muscle belly. Owing to an epidemic among the operated rabbits, only 3 out of 13 furnished any positive findings. In fact, it was not until February, 1917, that a rabbit was obtained in which stimulation of the implanted nerve trunk evoked a normal strong contraction in the previously paralyzed muscle; this response was as strong as that obtained from stimulation of normally connected motor nerve trunks in the vicinity. This finding was repeated and confirmed at the end of May, 1917, the animal was killed and the muscle in the vicinity of the implanted nerve was examined for the author by Dr. J. H. Globus, who used the gold chloride precipitation method. Similar findings were subsequently obtained in two other animals. One showed a weak but definite response at the end of 4 weeks, and a normal, strong response at the end of 12 weeks. The other showed a definite response at the end of 12 weeks.

From their own experimental work, in which the same procedure has been applied to different groups of muscles in different species of animal with the same result, together with that of prior investigators, it seems fairly well proven that a recently paralyzed muscle can be innervated by implantation of a motor nerve. This may be the identical nerve which originally supplied the paralyzed muscle or some other motor nerve.

NEURO-THERAPY.

THE TREATMENT OF ASTHMA.—Geyser, *American Medicine*, gives this advice as to the treatment of asthma:

With a faradic current examine the spine. Certain areas will be found that are hypersensitive to the current. A red spot usually appears in such areas. Apply one pole of the faradic current over the red or hypersensitive spot or spots, the other a large pad electrode over the entire lung area anteriorly. The interruptions at the vibrator point must be at least 5,000 or more per second. After applying this current for 15 to 20 minutes the spasm will be relieved and stay so for a number of days. By repeating this treatment daily or even on alternate days for two weeks, the patient will be free for months.—*Therapeutic Gazette.*

THE USE OF X-RAYS IN HYPERACIDITY OF THE DUCTLESS GLANDS; WITH SPECIAL REFERENCE TO EXOPHTHALMIC GOITRE, AND CERTAIN FORMS OF OVARIAN DYSMENORRHEA.—F. Hernaman-Johnson, *The Practitioner*, believes that in exophthalmic goitre (a) x-rays are a specific in the sense that the secretion of the thyroid may be diminished to any required degree. (b) When the secretion is seriously vitiated in quality, suppression may have to be carried so far that subsequent permanent thyroid feeding is necessary. (c) Such cases are fortunately rare, and it is in them only that any risk to the skin is involved. The dangers are in no sense comparable with those associated with the operation for total ablation of the gland. (b) Cure cannot be effected in the presence of any persistent irritation, mental or physical, and reduced activity on the part of other ductless glands may be a factor in delaying cure. (e) The bedside administration of x-rays in acute cases threatening life is urgently called for.

With regard to other ductless glands, x-ray treatment is in its infancy, but progress will doubtless be made in the future. It may be well to point out that there is no class of case less amenable to unintelligent routine treatment than that referred to in this paper. To be successful in dealing with such patients, it is not sufficient that a man should have a thorough grasp of electrical technique; he must also possess wide medical knowledge and sound judgment.—*St. Paul Medical Journal.*

CLINICAL PSYCHIATRY.

SOMNAMBULISM.—L. Grimberg, the *Psychoanalytic Review*, after reporting cases, one of his own, discusses the physiology [*pathology?*] of somnambulism, which indicates that though the forebrain is not participating, the midbrain and the cerebellum are in full activity.

Physiological experiments have shown that by removing the forebrain of pigeons or dogs, the animals still retained the ability to coordinate their acts, such as flying, walking, etc.

In somnambulism the individual is sleeping, the activity of the conscious sensation, volition and ideation is abolished, the only part remaining is the action of the cerebellum and midbrain; in other words, a dissociation between the conscious and subconscious centers, a neuron disaggregation, or dissociation.

In somnambulistic attacks the individual appears to be under the direct control of former subjective impressions, which are hidden from the individual during the waking state. He performs the actions which are a wish fulfilment and the attack ceases when the aim is attained.

In all the cases from which the author draws his conclusions, the attacks were provoked by an external stimulus.

In the cases known as lunatism, the attacks come on only at the full of the moon and only when the moonlight penetrates the room of the sleeping patient.

PSYCHONEUROSES, PSYCHOSES AND MENTAL DEFICIENCY.—Alfred Gordon, *American Journal of Insanity*, writes that the psychic manifestations described in this study have been a subject of carefully kept observations covering a period of several years. The object of making a separate study of this series out of a vast amount of material in hospital and extramural work was to ascertain particularly the nature and rôle of immediate causative factors so that correctly based inferences could be drawn with regard to the problem of management and as a contribution to the problem of prophylaxy.

The entire series, consisting of 2,000 cases, presented the following groups: 1,100 cases of psychoneuroses, 660 psychoses, 240 cases of mental deficiency with morbid psychic manifestations.

A very instructive chapter constitutes the study of the *psychoneuroses* from the standpoint of etiological incidents.

It is quite solidly established that individuals who present episodically during their lifetime manifestations of psychasthenia are endowed with a psychopathic constitution. They usually present various anomalies of character and their chief characteristics lie in a defective or inefficient adjustment to the environment. The obsessions, imperative impulses, phenomena of special fears, hypochondriacal ideas, fixed ideas, hysterical paroxysms, aboulias, states of anxiety, states of doubt or indecision are all manifestations which have at the time of their appearance psychogenetic factors at work, but it remains undeniable that they occur principally, if not exclusively, in individuals with that special make-up which constitutes a neuropathic underlying basis.

A close observer cannot fail to see that in normal life every one of us is subject to the same emotional elements which form a basis for psychogenetic agents and still the psychasthenic manifestations are not in evidence. If psychogenetic factors are apt to produce abnormal psychic phenomena in some individuals, it is strikingly evident that the latter are especially predisposed to morbid manifestations and are readily influenced by causes of a disturbing character. This predisposition which constitutes the psychopathic make-up may be acquired through toxic agents such as syphilis, alcohol, tuberculosis, or it may be hereditary. In the latter case are usually observed either identical or similar psychic phenomena in parents or near relatives or else some different type of disorder in the domain of cerebral functions.

In the group of psychoneurotics of this series an inquiry was made with regard to predisposing factors. In the largest majority of the cases (700) a morbid heredity could be traced. Psychoses, alcoholism, constitutional diseases, such as diabetes, pernicious anemia, gout, malignant neoplasms, syphilitic manifestations could all be revealed in the family antecedents. Psychoses and various psychic manifestations predominated. Two hundred and fifty individuals presented a personal history of alcoholism or syphilis or both but without a morbid heredity. One hundred and fifty psychoneurotics gave morbid family histories combined with personal degenerative elements, such as tuberculosis, alcoholism, syphilis and protracted malaria.

It is now interesting to consider the factors which played an immediate rôle in the development of the psychasthenic manifestations. It was mentioned above that the latter occur episodically in the patient's life. They disappear with or without treatment and reappear. Some of my patients had as many as ten or fifteen recurrences in a period of two or three years. Recurrences are characteristic. The very nature, the fundamental underlying make-up of such individuals are bound to lead to repetition of psychasthenic disorders. The latter may repeat themselves exactly or else manifest themselves in a different form. Thus we observe at one time phobias, at another aboulias, at another doubts or obsessions. Sometimes we observe combinations of two or more varieties. It is self-evident that when we deal with a mental state whose chief characteristics are: instability, want of determination, a fundamental inability of adaptation to surroundings and circumstances, deficient manner of reflecting upon one's own conduct and relations to others, defective or perverted sentiments and instincts, inability to see things properly and to feel normally, absence of the faculty of proper appreciation of facts and therefore frequent commitment of errors, absence of good judgment and consequently inability of carrying out properly and to the end plans and projects initiated by themselves or others; want of properly measured initiative and inability to see and concentrate attention upon the main issue of undertaken tasks—when therefore we deal with individuals presenting such a defective mental constitution, we are to expect superimposed mental disorders of a psychasthenic nature at any time during life.

A psychopathic make-up stands ever ready to take in and hold on to disturbances referable to functional nervous manifestations. All that is needed is an exciting cause. The factors that initiated, so to speak, in these cases, the psychasthenic disorders, were all of effective character.

A NEW DEPARTURE IN THE TREATMENT OF INMATES OF PENAL INSTITUTIONS.—Samuel C. Kohs, *Publications of the Research Department Chicago House of Correction*, writes that all persons between the ages of 17 and 21 who are sentenced to the House of Correction are subject to call for psychological diagnosis. Of these there are a number who are recommended to the Psychopathic Department of the Boys' Court. Whenever this list is exhausted older inmates, particularly recidivists, are studied. The purpose of the studies is to see that the subject is properly adjusted at work for which he is best fitted. The laboratory atmosphere is such that the subject will feel as much at home as possible. The tests are applied in the following order: vision, audition, Binet, association, Healy, diagonal, Knox, ethical tests, following direction, "A," Courtis, form-board, anthropometry, fatigue index. As a result of the examination the subject may be placed in a defective class at vocational training or ordinary labor about the institution. An attempt has been made to correlate mental age as determined by the Binet Scale with the kind of work that the individual is able to perform at that age level. It was found that the higher the mentality the more able was the person to perform activities of a complicated nature, and the smaller became the amount of supervision necessary. Thus after giving the Binet Test and determining the mental age, one can be fairly certain in estimating the complexity of work the subject can perform, and the amount of supervision which will be necessary. A follow-up system is being instituted in order to check up the prognostications. An outline of plans for the future is appended.—*American Journal of Insanity.*

ARTERIOSCLEROSIS AND ITS RELATION TO MENTAL DISEASES.—Dr. Edward E. Leonard, *The Institutional Quarterly*, July 30, 1917, writes that until recently little has been written regarding the significance of arteriosclerosis as an etiological factor of psychic symptoms, though his experience has led him to believe that arteriosclerosis is an important factor in producing mental changes. It appears that atheromatous insane suffer from the chronic and incurable forms; while the nonatheromatous, from the acute forms of mental disorders.

The physiological explanation for the frequent involvement of the cerebral arteries is that they are straight arteries, i. e., their axis is in a direct line of the blood stream, and hence are particularly subjected to the highest mean blood pressure, as well as to the direct blow of the cardiac systole.

The histories of patients admitted to State hospitals show the *causes* given for production of insanity to be, in a great many instances, the same as the etiology of arteriosclerosis. For example, chronic alcoholism, overwork, interstitial nephritis, gout, diabetes, high living, syphilis, tuberculosis, rheumatism, influenza, scarlatina, etc.: also certain nervous factors, as worry, emotion, excitement, or excessive brain effort.

Attention has been called to the fact that the nervous system may suffer in three ways as the result of arteriosclerosis: (1) There is a reduction or marked change of metabolism due to arteriosclerotic disease in one or more organs; (2) the changes in the nervous system are directly the result of disturbance in the vascular mechanism; or (3) there may be a lowered metabolism due to a state of exhaustion caused by the action of toxic substances.

The following mental conditions may show pathological changes in the arteries: Intoxication psychoses, organic and senile insanity, manic-depressive and symptomatic depression, involutional psychosis, paresis, epilepsy (especially senile), and even in some cases of dementia praecox.

A study of its symptoms and physical signs, in addition to the use of the sphygmomanometer reveals the fact that many of the symptoms of which patients complain are due to hypertension. But in a number of cases the blood pressure is not raised.

An examination of the peripheral vessels does not always give a correct idea of the extent of the arteriosclerosis, as the vessels of the brain may be involved more than the peripheral vessels.

It is necessary to take into account that there need not be a specific agent to cause arteriosclerosis, but that any factor capable of producing a long-continued irritation of the vessel wall will result in connective tissue changes. Two etiological features of this disease, however, stand out prominently: (1) Increased blood pressure from any cause, and (2) certain hereditary influences that induce degenerative changes in the vessels. (In some families there is an hereditary tendency to apoplexy.)

Indiscretion in eating and drinking, with the resultant intestinal fermentation, is a frequent cause of increased blood pressure. Bacterial toxins, metallic poisons and tobacco are also etiological. In ten cases, alcoholism was given as a cause, and syphilis is said to be responsible for a large percentage of cases.

Prolonged or excessive muscular efforts also act as a contributory cause of arteriosclerosis. The occupations of the patients were, to a large extent, farmers, laborers, or mechanics.

Atheroma is frequent in the aged and is due to senile changes, but endarteritis obliterans may occur at any age, many cases having been reported between the fortieth and fiftieth years.

Symptoms.—The earliest symptoms may be neurasthenic in character, as complaint of slight headache, some insomnia, a general feeling of malaise, attacks of giddiness, epistaxis, singing in the ears, and the patient may be slow in thought and movements, is irritable (irritability of temper is fairly constant), shows lack of control over emotions, and is unduly sentimental. When headache occurs and persists, with occasional vertigo, the possibility of arteriosclerosis should be suggested. The patient may also complain of temporary sensations of numbness or weakness in one limb, or one side of the body, irregular darting pains in the head, and slight uncertainty of vision. The motor sensory or psychic field may be involved in the symptomatology.

As the disease progresses he becomes disoriented, does not know where he is, has no idea of his age, and is unable to tell what year it is. Failure of memory is noticeable from the first. Proper names and recent events are difficult to remember. The cortical perception centers are incapable of retaining new impressions and the patient lives in the past. He also forgets where he places things, and perhaps accuses others of having stolen them. At first he makes mistakes in his odrinary work, later he loses the faculty of using objects correctly. Throughout the whole course of the disorder insomnia at night is the rule and is accompanied by motor restlessness. In the daytime, however, these patients are peculiarly liable to drop off to sleep in the midst of a conversation, or even when actually speaking. There is no classical picture.

As even the few facts and statistics given seem to justify the conclusion that there is some relation between mental diseases and arteriosclerosis, the point emphasized is that the neurasthenic, anemic or hyperemic brain symptoms of a patient in middle life should not be passed over lightly, for they may be signs of cerebral arteriosclerosis. These patients should be carefully examined and their mode of living so regulated as to minimize the progression of the disease as much as possible.

THE DIAGNOSTIC VALUE OF SPINAL FLUID AND WASSERMANN TESTS IN PSYCHIATRY.—Egbert W. Fell, *American Journal of Insanity*, considers this subject especially in its relation to the diagnosis of paresis which "should only be made when the neurological signs are present."

The author's conclusions are based upon 500 consecutive admissions to the Elgin (Illinois) State Hospital, in whom were given serum and fluid Wassermann tests, globulin tests and cell counts. Of these, 215 were luetic psychoses and 285 non-luetic psychoses. The gold chloride test was not used.

The following are his conclusions:

(1) *Establishing the Existence of Paresis.*—In paresis the tests *failed* as follows: Globulin increase 2 per cent., pleocytosis 10.5 per cent., serum Wassermann 7 per cent., fluid Wassermann 4 per cent.

In the non-luetic psychoses the tests were *positive* as follows: Globulin increase 5.5 per cent., pleocytosis 3.5 per cent., serum Wassermann 9.5 per cent., fluid Wassermann none.

Cell and globulin increase in non-luetic psychoses was found especially in organic cases where a differentiation was important.

There is abundant evidence that positive fluid findings may occur without paresis in the primary and secondary stages, and it is probable that they occur without the mental symptoms of paresis in the "pre-psychotic" stage.

It is not argued that a positive spinal fluid Wassermann is of itself conclusive evidence of paresis, nor that a negative test excludes paresis, but it is so constantly positive in the one and negative in the other that it is of the greatest value, in a case where a differentiation must be made, in distinguishing between a luetic and a non-luetic psychosis.

(2) *The Extent of the Paretic Processes* cannot be determined with any degree of accuracy by laboratory tests; it can only be said in a general way that globulin and cell increase seem more marked in the more rapid cases.

(3) *The Distinction Between a Paretic Process and a Tertiary Luetic Process,* or the extent to which each is present, cannot be determined in the laboratory. The gold chloride test is of some help in this direction, but the therapeutic test is the only one of much value.

(4) *The Diagnosis of the Combination of Paresis with a Functional Psychosis* should be made with extreme caution.

(5) *In Making a Diagnosis of Recovery* in a case of paresis which has cleared mentally the following conditions should be considered:

1. A functional psychosis in the primary or secondary stages of syphilis.
2. A functional psychosis in the "pre-psychotic" stage of paresis.
3. A remission in paresis.

It should be remembered that the first two occur quite infrequently, the last very frequently, the spinal fluid findings remaining positive.

KORSAKOW'S PSYCHOSIS IN ASSOCIATION WITH MALARIA.—H. Carlill, in the *Lancet* of April 28, 1917, writes that loss of memory occurs as the result of shell-shock; it may be simulated to avoid uncongenial service, and it is a symptom of dementia paralytica, concussion, alcoholic psychoses, senility, and epilepsy. The form of amnesia described by Korsakow as occurring in alcoholic patients with peripheral neuritis has also been found, associated with nervous symptoms, in other illnesses, such as typhoid, diabetes, and arsenical poisoning.

The writer here describes the case of a stoker, æt. 45, with the characteristic mental symptoms of Korsakow's psychosis, which he regards, in this instance, as malarial in origin. The neuritic symptoms were confined to a loss of the ankle-jerks. General paralysis was excluded by a negative Wassermann reaction.—*Journal of Mental Science.*

EDITORIALS.

NEW FIELDS OF MEDICINE.

The older text-books that were popular in medicine, as well as some of the modern ones, give great prominence to methods of treatment to drug effects, and drug combinations, minutely balancing and comparing drugs and the way in which they influence the organism. The modern text-books, with few exceptions, say very little about drug effects, and commend very few drugs, but speak in general terms of what may be expected to do by such and such means of treatment. One of the popular text-books devotes twenty pages to the symptomatology and pathology of typhoid fever, and less than a hundred lines to its treatment. Another book, equally popular, describes pneumonia with startling minuteness, covering many pages, and the treatment is condensed in a very few lines. This is thought by the older physicians to be a grievous fault. The younger men are equally confused, and do not know what to do, except to refer to some older writers and the hospital experiences in their school days.

This wide variation noted in text-books and papers suggests some various pronounced causes, one of which is the dangerous materialism, which has been the chief fascination of University study abroad. Students have flocked to Europe, with an exalted conception of the capacity of foreign teachers, to map out the changes of cell and tissue and indicate the beginnings and progress of disease. This was called originally research work and was confined almost exclusively to materialistic demonstration of what could be seen and reasoned from objective signs. In this way they have been able to point out with startling minuteness symptoms and signs, and describe with great certainty the beginning and progress of diseased processes. Coming back from foreign study with a glamour of great scientific knowledge, it was found in the course of years, that they failed, seldom rising above the levels of their less trained contemporaries, and often being very inferior in their practical work to the imperics of their neighborhood. Many of these foreign trained men brought with them a fatal egotism that prevented any real work of original character; they assumed a superiority of knowledge, and, trusting in this, they were content. Not infrequently such persons write books, and always contribute articles to papers, giving the most exact description and detailed theories, and sustaining them by quotations from unknown foreign authors. To the practical man, these may sound very stimulating, but they give little or no help in the actual treatment of disease. There is in all this a materialism which ignores everything that cannot be seen objectively, or demonstrated by figures and instruments of precision; and this actually dwarfs and limits the real progress that should be made in medicine. The alert, enthusiastic student from this country comes back from foreign study crippled by false conceptions of disease and methods of determining it, while his associate, who was not able to go abroad, but was forced to continue his studies at home, in practical life, has really become an ardent explorer and student, watching and observing every phase of medicine, forming his own conclusions and investigating facts independent of any previous theories. The former soon falls into conservative lines of thinking, ignoring anything that he has not learned, and comparing all the facts of the present with the materialism of foreign teachers.

There is coming a great disillusional process; German science and studies have failed, and foreign teachings springing from theories cannot be accepted on their face value, no matter how well endorsed they may be. Medical science in America already shows signs of leading all the world in new discoveries and new applications of facts. Practical men realize everywhere that there is something more to the study and treatment of disease than the books and their theories indicate. There are laws and forces behind the surface indications which are not explainable from any present theories. The germ theory of disease and the almost innumerable causes of infection, poisons and cosmic influences, as well as the traumas of every kind and description, give very limited conception of what medicne is and should be. Today all our scientific acumen is expended on exploring the common every-day shore lines of life, marking out reefs and isolated rocks, charting the visible danger points. Life saving stations are put up here and there, and danger signals are hung out, but there has been no study of the air-currents, the pernicious mental influences and invisible forces of mind over matter. Human navigation from the cradle to the grave is a stupid, blundering voyage, without any knowledge of the winds, skies, and the imperfectly acting machinery, that should, if wisely directed, bring success.

There is a realm beyond this that is called Psychotherapy, occupied by imperics and pathies, mind-curers, healers and a great body of mercenary incompetents, who see a single fact and put it in practice with the grossest kind of extravagance, ignoring everything else but the one apparent, so-called fact. Undoubtedly this is the reaction from medical materialism which dominates the schools, and they sneer at everything that cannot be demonstrated according to their own standards. A religious cult has gained prominence in showing the influence of the mind over matter, and as another imperic effort, it carries a few facts into the realm of credulity, dogmatism and stupid extravagance. These are the realms of medicine to be explored, and along these lines a few ambitious men have marked out a marvelous country and realms of activity at present unknown. Preventive medicine, preventive measures of every kind for present evils, have startled the scientific world and indicated possibilities for future work. The health boards of every town and city are the advance pickets of the great coming army to diminish disease and increase longevity. A spirit of research outside the laboratory, in the broader field of human activity, and thought and conduct, is dawning. Something more is required than a study of the objective causes; these are only surface symptoms and results of unknown forces. Exhaustive studies of tuberculosis, of cancer and a host of other evils, including the spirit and drug addiction, fail to bring relief because they do not go far enough back to determine the real forces that have culminated in this way. Laboratories are doing great work in this field, but there are studies outside of these awaiting enthusiastic students, and promising the discovery of new regions of causes unknown at present. Preventive medicine in America can be pursued above all theories of schools and teachers; the country physician can do original work here, by observing and co-alating facts that will throw new light on problems unknown. Physicians in America are independent, more so than in any other country in the world; their separate schools may have taught them distinct theories of disease which they will follow, but if they have the scientific spirit there is a boundless field of research everywhere. Today, when the alcoholic problem is coming into prominence in every town and community, physicians are the only students who, by training and observation, can determine the real causes and the real methods of prevention. Research work of this kind has been started in Hartford, to give direction and assist in scientific efforts, to point out the real causes that are over-looked by the great philanthropic efforts of the present. The same is true of cancer, of tuberculosis; something is required more than laboratory work. In geology it is called field work, which means tramping over the grounds and judging from present appearances the forces and influences which have been at work in the past. Contract practice, industrial insurance practice are all really field workings to determine the primary causes, and stop them at the beginning. The physician who contracts with the family to give them his services for a stated sum, becomes intensely interested to observe and prevent the beginnings of disease, and in this way he is brought face to face with a new realm of causes which would have escaped his attention and be difficult to find when the patient becomes ill and sends for him. These are only the beginning of study in this new realm. The present practice of medicine, assuming that certain symptoms mean results of certain causes, which require certain drugs, or certain combination of drugs, to relieve, cannot be verified in any scientific research work. It is said that it is the best we can do at present. The modern physician will investigate, examine and determine whether so-called symptoms are traceable to certain causes or to certain other causes, before he will attempt to correct them. The unthinking physician takes the assumption as a fact, if it is based on text-books, and when he fails in his treatment ascribes it to other causes, and like the Turk, calls it the Will of God, and thus displays his incompetency. Every physician should be an independent observer; he should realize that it is possible for him to determine the forces of disease, and point out their methods of prevention. He must be an independent thinker, must be able to observe accurately and to reason wisely, and determine what means and measures can be used to the best advantage. While all physicians are not competent to do this wisely, there is in every community someone with an original spirit of research who is looking for new indications and new means of diminishing disease and increasing longevity. The war has broken up most of our previous conceptions, and we are constantly staggered at the new methods of utilizing the forces about us. This is true in medicine; drug therapy, and almost every other kind of therapy have got to start anew, go farther back, cross the line into the unknown and try and map out forces and conditions that control human activities. The influence of mind over matter is one of these realms, that is white for the harvest, and few, if any, laborers are trying to gain the marvelous new realms of facts. The time has come for thoughtful men to take up this subject and mobilize the facts and put them to practical service in the great question of disease and treatment.

THOMAS D. CROTHERS, M. D.

THE STATE OF MIND ON THE DEMENTIA PRAECOX PROBLEM

This war has popularized the expression "the state of mind." There is such a thing as a mental or intellectual *datum* in any individual on any subject and it has been commonly recognized, but to conceive of a world-wide, a national or a municipal "state of mind" is a very recent conception outside the academic forum. It is plain to us now, however, for we read about it in our daily papers at breakfast, and we find it one of the main supports in every argument of the ponderous reviews.

"The state of mind" of the alienists and boards of control relative to the dementia praecox victims has long been at a low, pessimistic, *laissez faire,* stagnant ebb. The term "dementia praecox" is accepted by all, the diagnosis in any case is undisputed, the patients are unanimously and unhesitatingly shunted into the "hopeless group" and left there without research, without therapeutic attention, and without symptomatic relief. Any attempt at the betterment of their condition is met with contumely, derision or distrust. It is possible for the unprejudiced outsider to understand the state of mind of the psychiatrists and the keepers of the insane towards this condition only by visiting the untidy wards in our State Hospitals in the early morning hours. A hundred or more beds will be found in a single dormitory and fifty of them wet and dirty. It is not possible in words or print to describe one's sensations at such a condition. Then the unprejudiced outsider must visit the cow barns of the same institutions, housing the pedigreed stock, with the cement floors and gutters washed with running water. Next he should visit the hog pens, perhaps within two hundred feet of the "untidy ward," with the clean second story sleeping pens and hose-washed feeding floors. He should not fail to inspect the poultry runs near by and notice the carefully sprayed and sanitary hatcheries. And last of all he should line up on one side the state paid attendants of the cattle, of the hogs and of the poultry, with the bachelors or doctors of agriculture at the head of this line, pay roll in hand, and on the other side the attendants of the patients, the orderlies, the door keepers, the pharmacists, the dentists and the doctors of medicine with the hospital superintendent and their pay roll. Let him compare the two lines, compare the condition of their charges, compare their pay rolls, and then only may the unprejudiced outsider evaluate the state of mind of the whole profession of the keepers of the insane and the boards of control toward the dementia praecox problem. *The condition of our dementia praecox wards expresses "the state of mind" of the alienists and psychiatrists, and hence the lay public, toward the dementia praecox problem.*

What are the actual scientific facts relative to this undisputed disease or "symptom complex"? Whose problem is it and how should it be solved?

I. The onset of dementia praecox is usually slow, frequently insidious, but occasionally sudden and explosive. The age of the patient at the first episode requiring professional attention is generally close to nineteen, but cases are observed in victims as young as fourteen and as old as fifty.

The mortality of the first attack is unknown, for there are no methods of diagnosis by objective symptoms in general use. Some patients die during an initial and perfectly diagnostic episode, and this event will be recognized oftener when scientific physical, chemical, biochemical and serologic diagnostic examinations displace the catechismal fashion of today. The mortality of the initial two years of the symptom complex is not negligible, and excluding suicide often a diagnostic episode in itself, probably reaches one in twenty or one in thirty cases.

The average duration of the disease under present custodial conditions, as shown by the hospital reports of New York, is a little short of fifteen years (La

Moure). Many patients, however, live forty years in confinement, and one bed patient was still alive after twenty-one years of tube feeding (Justschenko). A man of eighty was recently transferred to the Peoria State Hospital whose commitment papers were dated 1852, sixty-five years ago. The causes of death are irrelevant. However, in hospital cases tuberculosis leads, as we might expect, and then follows a sequence in no obvious manner characteristic of this disease. From the medico-legal standpoint, sudden death, broken bones, ecchymosis and necroses of digits, sometimes symmetrical, have commanded an undeserved attention. Sudden deaths in disturbed dementia praecox patients under most favorable surroundings and care, in continuous baths, in bed with or without restraint, have occurred unexpectedly, and autopsy skilfully performed soon after death has failed to reveal adequate morphologic findings to explain the tragic end (Nissl). The osteoporoses of dementia praecox patients cannot be explained by, or related to, their inactivity or to the malnutrition of these patients. They suffer of *fragilistas ossium* and thus occasion legal investigations. Inexplicable gangrene also has led to criminal prosecutions of innocent attendants.

Although the autopsy findings in dementia praecox are not insignificant, one could hardly declare from the post mortem examination alone that a cadaver was that of such a patient. Perhaps the most profound change of all is to be found in the brain. The brain weight compared with the cranial contents exceeds Tigges' formula, and the brain weight compared with the body weight exceeds Reichardt's formula (Nissl). These are practical post mortem diagnostic procedures not yet in common use in our state hospitals. In spite of this heavy brain there is frequently found an assymetrical hydrocephalus. These macroscopic abnormalities were found by Southard nineteen out of twenty times in the left cerebrum. The testicles in men dead with dementia praecox average about one-half the weight of these organs in the normal man of the same age and body weight (Lőmer), and the testicles of these cadavers contain no spermatozoa (Todde). The ovaries of females dead with dementia praecox weigh less than one-third as much as those of sane women of the same age and weight.

In the initial stages of this symptom-complex the systolic blood pressure is generally low, 70-100 mm. of mercury, and the intramuscular injection of 0.5 c.c. of adrenalin (P. D. & Co.'s) will not raise it (Willi Schmidt). The pupils are usually dilated, but sometimes contracted and often irregular (Bumke, Georg Blin) and in any case the instillation of a few drops of adrenalin solution into the conjunctival sac produces a strong reaction in ten to sixty minutes. This it does not do in the eye of the healthy (Neuberger). The fundus of the eye shows congestion of veins, and papillary blanchings like those of typhoid or of delirium tremens or of gastric tetany (Georg Blin). Even in early episodes the veins in the upper lids are enlarged as they usually are in the second and following weeks of whooping cough, and coincident enlargements are observed in the veins on the back side of the auricles. These enlargements are not, of course, as bizarre as those observed in brain tumor, though they probably result from a protracted, increased intracranial pressure. Lumbar puncture discovers an intraspinal pressure far above normal, 125 to 350 mm. of water. This pressure continues high even after the patient is apparently cured.

The blood in the early stages of the disease is generally greatly concentrated. 8,000,000 reds and 9,000 whites is about the average in initial episodes, but the changes in concentration are unaccountably rapid and the approach of the erythrocytes to normal and an increase in the whites is accompanied by improved mental manifestations (Kahlmeter). The defensive ferment reactions show almost pathognomonic localized brain and sex gland lesions (Fauser, Retinger). This test alone is quite as characteristic of dementia praecox as the Wassermann reaction is of syphilis; or the Lange, of general paresis. The finger nails and toe nails usually show transverse striations or transverse indentations, obviously records of past periods of diminished general nutrition, perhaps former episodes of the disease. The secretions of the skin and scalp are often enormously increased, so that a few hours after a most thorough bath and shampoo it is possible to scrape great masses of sebum or other secretions from the skin of the neck behind the ears. The arms, hands and legs show peculiar cyanotic patches of edema which edema does not indent on pressure, though it blanches and more rarely still such an edema becomes ecchymotic or even gangrenous. In advanced cases the legs below the knees are very small and appear to be atrophied as compared with the thighs above, and occasionally they are found with an excessive growth of hair. The growth of hair on the face, however, is greatly retarded and in an almost incredibly short time the face of the formerly mature masculine boy becomes childlike in appearance. The handshake is lifeless or in catatonic conditions the hand is tetany-like. In late stages the interossei muscles are apparently atrophied.

The test meal of barium followed by frequent fluoroscopic examinations shows that the gastric and intestinal motility and muscular efficiency in dementia praecox patients are normal as far down as the iliocecal valve. Except in stuporous patients the barium residue is all in the cecum at the six-hour seance. The activity and especially the antiperistalsis of the cecum is usually exaggerated and the wall of the cecum thickened, but, nevertheless, in the great majority of patients there is a protracted delay of the barium residue in the cecum. This delay extends beyond the third day and often well into the second week. Moreover, fluoroscopy shows a retort shaped cecum with a "U"-shaped loop just to the left of the hepatic flexure, which loop opens into the empty and gas-distended transverse colon through a contracted sphincter of Cannon. When the distended U-shaped loop is compressed with the hand, the opaque meal may be forced through the ring of Cannon in capsule-shaped masses which can be seen fluoroscopically tumbling, end over end, with the succeeding peristalsis down the gas distended transverse colon.

The watery extract of the stools from these patients contains a large amount of a Pauly positive filtrate. This filtrate is strongly oxytoxic, that is to say, it contracts the virgin guinea pig's uterus in very dilute solutions. If this watery extract is placed in a dialyser, in the cold for two hours or more, the dialysate is Pauly positive and oxytoxic. If a portion of this watery extract is concentrated and absolute alcohol added, a large precipitate falls, the residue is still both Pauly positive and oxytoxic, while the precipitate dissolved in water is Pauly positive but oxytoxically inactive. The former is probably histamine and the latter proteoses or poly-peptids containing the iminazol or other rings. Both are exquisitely toxic.

Cultures from the stools of dementia praecox patients contain a rich flora of aminoacid-destroying, colon-like bacilli. One of them, the *B. aminophilus intestinalis* (B. & B.), when grown at 37° C. in an oxygen free atmosphere in a medium consisting of inorganic salts and histidin with a hydrogen ion concentration of 6.8-7.4, results in a Pauly positive residue having an oxytoxic activity. That is to say, the organism produces histamine from histidin in a neutral solution at 37° C.

The urine of dementia praecox patients shows as many pictures as the disease itself. The urine is occasionally lighter than water, and then it contains large quantities of acetone (Walter Hart). It is often loaded with indican and indolacilic acid (Ross). So far no catabolic product of histamine has been detected in the urine. One might expect to find urocanic acid, but there is no certain way of clinically detecting this hypothetical excretory product. In the long run calcium salts are increased in the urine.

Such, in short, is our knowledge of the physical basis of dementia praecox today.

II. It is obviously the duty of the State to solve the dementia praecox problem. Of the 208,000 inmates of the Institutions for the Insane in the United States, not far from 150,000 are cases of the insanity of youth. The average economic expense is $200 per year or an aggregate of $30,000,000 annually for the whole United States. The shortest sighted citizen cannot fail to see that this is a major political issue which no State has undertaken adequately to meet. Each State has spent millions for custody but nothing for research and cure.

It is pitiable to recognize our own rich United States caring for, in the most pessimistic manner, one hundred fifty thousand dementia praecox patients and supporting no institution for research, no league or effort for the study of this disease and the emancipation of the twenty thousand young men and young women who are entering the institutions annually only to degenerate and die.

The problem is one which offers every hope of a happy solution. The mental condition of the patient is not so deteriorated as it has been premised. Occasionally a patient does recover after twenty years of mutism and inactivity and slowly returns to a happy, useful and active life. Enough is now known of the physical basis of the disease to guide to a successful campaign of research. The issue is dependent on "*a will to know*" and "*a will to cure.*"

III. Although this is obviously a problem of the State, this obligation does not preclude private initiative. The "state of mind" in any community large or small is but the equilibrium of the intellectual *datum* of the multitude, some high, some low; some inert, some dynamic. The 150,000 dementia praecox boys and girls went from as many homes in the States and left 300,000 parents broken-hearted and confounded. They were broken-hearted as by a terrible misfortune, but confounded at the cruelty of public custody and the impotency of professional psychiatry. The fateful inscription above every dementia praecox ward is, "Who enter here leave all hope behind." Not only do they leave all hope, but they leave no door open to research. The State spends millions for custody but not one dime for cure.

There is enough known of the physical basis of this disease to guide to many points of attack. They are open to the trained scientist with the guidance of the inspired clinician who has the *motive* and "*a will to know*" and "*a will to cure.*" It is not a problem of bacillus hunting, but it is the conquering of a whole continent of ignorance. In a matter of this moment, the professional research promoter is aghast. Only the enthusiast can successfully carry out this adventure against the opposition of the profession and the lumbering heartlessness of the political machine. Yet from this machine the aid must come for the establishment of an interstate, co-operative laboratory for the solution of this problem and the saving to home and happiness more than twenty thousand young lives now annually doomed to deteriorating custody.

BAYARD HOLMES, M. D.

NEUROLOGICAL AND PSYCHIATRICAL EXAMINATION OF TROOPS.

At the request of the Surgeon-General, the Committee on Clinical Methods and Standardization of Examination and Reports, a subcommittee of the Mental Hygiene War Work Committee of the National Committee on Mental Hygiene, has submitted an outline to be followed in determining which men should be excluded from military service on account of mental and nervous diseases.

This committee is composed of the following physicians: August Hoch, Ward's Island, New York; Adolf Meyer, Johns Hopkins University, Baltimore; Thomas W. Salmon, New York; Pearce Bailey, New York; E. E. Southard, Boston; Albert M. Barrett, Ann Arbor, Mich.; William A. White, Washington, D. C.; Walter E. Fernald, Waverly, Mass.; Joseph Collins, New York; T. H. Weisenburg, Philadelphia, and Robert M. Yerkes, Cambridge, Mass.

The following is the outline:

Nervous Diseases.

(*a*) On the Basis of Disease.

1. Tabes. (Look for Argyll Robertson pupils, absent knee and ankle jerks, ataxia of station and gait.)
2. Multiple sclerosis. (Look for absent abdominal reflexes, nystagmus, intention tremor.)
3. Progressive muscular atrophy and syringomyelia. (Look for fibrillary tremors; atrophy in the small muscles of the hand and of the muscles of the shoulder girdle; scars on forearm and fingers caused by burning; deformities of feet.)
4. Epilepsy. (Look for deep scars on tongue, face and head; voice. Where diagnosis depends only upon history of epileptic attacks given by the patient, the latter should be asked to give the address of the physician who has treated him. This history must then be verified by a letter from the physician.)
5. Hyperthyroidism. (Look for persistent tachycardia, exophthalmos, tremor, enlarged thyroid.)

(*b*) On the Basis of Symptoms or Combination of Symptoms or History.

1. Unequal pupils; irregular pupils; Argyll Robertson pupils.
2. Nystagmus (in one not an albino); absent abdominal reflexes; intention tremor.
3. Absent knee jerks associated with some one other organic neurologic symptom.
4. Exaggerated tendon jerks; Babinski.
5. Disorders of station or gait.

6. Disorders of speech (on test phrases); facial tremor; one other organic neurologic symptom. (Stammering and stuttering *per se* is not significant of an organic neurologic condition. Stammerers and stutterers are rejected by regulations. See form No. 94777.)
7. History of epilepsy. (Ask the recruit to give the address of the physician who has attended him; this information to be verified by letter.)

Mental Diseases.

(*a*) On the Basis of Disease.

1. General paralysis. (Look for Argyll Robertson pupils, speech defect consisting of distortion of words, writing defect consisting of distortion of words, facial tremor in showing the teeth, euphoria and marked discrepancies in giving facts of life.)
2. Dementia praecox. (Look for indifference, ideas of reference, feelings of the mind being tamperd with [*e. g.*, ideas of hypnotism], auditory hallucinations, bodily hallucinations such as electrical sensations or sexual sensations, meaningless smiles; in general, inappropriate emotional reactions, lack of connectedness in conversation.)
3. Manic depressive insanity. (Look for mild depressions with or without feeling of inadequacy or mild manic states with exhilaration, talkativeness and overactivity.)

(*b*) On the Basis of Symptoms or Combinations of Symptoms or History.

1. History of previous mental illness. (Ask the recruit to state when and where he had such illness, in what hospital he was observed or treated or by what physician he was attended; this information to be verified by letter.)

Psychoneuroses and Psychopathic Characters.

Look for phobias, morbid doubts and fears, anxiety attacks, fatigueability, hypochondriasis, compulsions, homosexuality, grotesque lying, vagabondage.

Chronic Alcoholism.

Look for suffused eyes, prominent superficial blood vessels of the nose and cheek, flabby, bloated, reddened face, purplish discoloration of the mucous membrane of the pharynx and of the soft palate; also ashen complexion and clammy skin, muscular tremor in the protruded tongue and extended fingers (noticeable also in lack of control when the applicant attempts to sign his name), emotionalism, prevarication, suspicion, auditory or visual hallucinations, paranoid ideas.

Mental Deficiency.

Look for defect in general information with reference to native environment, ability to learn, to reason, to calculate, to plan, to construct, to compare, weights, sizes, etc.; defect in judgment, foresight, language, output of effort, suggestibility, stigmata of degeneration, muscular incoordination (consult psychometric findings).

Drug Addiction.

Look for pallor, dryness of skin; flippancy, mild exhilaration (if under the influence); cowardly, cringing attitude; restlessness, anxiety (if without the drug), distortion of the alae nasi, contracted pupils (morphin) or dilated pupils (cocain), dirty deposit at junction of gums and teeth, bluish and whitish needle scars on thighs and arms.

BOOK REVIEWS.

THE DOCTOR IN COURT.—By Edwin Valentine Mitchell, LL.B., of the Massachusetts Bar, Professor of Law, University of South Dakota; Author of "Hospitals and the Law." Second Edition with Supplement. Published by Rebman Company, 141 West 36th Street, New York.

This is a valuable work of 200 pages on a subject too much neglected by the practitioner of medicine and surgery, notwithstanding that the knowledge of a small part of the contents of this work would probably be the means of putting money in the pocket of every physician who spends the time necessary to obtain it, and save many from the worry and loss of time and money incident to a suit for malpractice, to say nothing of the possibility of the payment of a judgment.

The supplement to this new edition is for the purpose of adding topics not previously included and such later decisions as announce new principles of law.

STATE PSYCHOPATHIC HOSPITAL at the University of Michigan, for the biennial period ending June 30, 1916.

Remarks upon the Vegetative Nervous System and the Internal Secretions. By Frederic J. Farnell, M. D., Butler Hospital, Providence, R. I. Reprint from the *Journal of Mental Science*, April, 1917. A brief, but comprehensive, study of a most important subject.

NATIONAL SERVICE HANDBOOK. Issued by the Committee of Public Information, under the supervision of Dr. Guy Stanton Ford, Director of the Division of Civic and Educational Co-operation of the Committee on Public Information. Government Printing Office.

No better idea can be given of the scope of this work than by quoting the introduction, from which we read:

"The one great task before the Nation to-day is to win the war. If our arms are to be successful, every citizen must give his all, whether this be time, or money, or life, or all three. To aid in this victory by answering an ever-increasing demand manifested by citizens throughout the Nation for reliable information on all branches of service, military and non-military, this Handbook is published. At this time it is of vital importance that all men and women throughout the land work together without wasteful haste, without misdirected effort, but with every ability and resource fully commanded in co-operation for the speedy ending of the war. To work effectively, yet passionately, we must work intelligently, and each must do his own task. It is to point out the most useful avenues of service, and at the same time inform each member of the community of the varied tasks undertaken by the Army and Navy and in the air, behind the plow and at the machines, by banks and by railroads, by doctors, nurses, and workers in the laboratories, by social workers everywhere, that this Handbook is sent throughout the Nation."

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THE INFLUENCE OF CEREBRAL EXCITATION ON THE MALE SEXUAL GLANDS.

Experimental and Anatomico-Pathologic Researches on the Cortical Genetic Centres.

By

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Prefatory Remarks.

IN EXPLAINING the results of my researches on the influence of the brain on the functions of the genital organs I have already demonstrated how, after partial destruction of the cerebral cortex (1), the testicles, in hemi-cerebrated adult fowls, show grave symptoms of involution which are partly traumatic and pass away rapidly, and partly delayed, subsiding slowly and progressively. In my communications I concluded, at that time, that there existed special centers, probably localized in the cerebral cortex, presiding over the functions and the trophic innervation of the male genital organs, particularly over the complex processes of spermatogenesis.

The same results and conclusions were arrived at afterwards by researches performed on chickens and on pigeons. These investigations established the functional relations between the brain and the female genital organs, and showed that lesions of the cerebral cortex gave rise, proportionate to the degree of the lesion, to severe disturbances of involution of the physiologic processes of regeneration and to destruction of the ova which were always partly immediate and transitory, and partly delayed, slow and progressive (2).

A true and absolute anatomic, or, more particularly, functional reintegration either of the male or of the female sexual organs, in these cases, I have not always been able to observe; it was only apparent and relative even when the animals recovered from the trauma and in time had entirely or almost entirely recovered their former general condition, as could be deduced not so much from the macroscopic and microscopic characters of these organs as from the quantity and quality of the products of conception of the animals when coupled between themselves or with other, normal animals (3).

The existence of cerebral genetic centers can be proved more conclusively in higher vertebrates. My investigations on adult dogs, in fact, have shown not only the enormous influence that the cerebrum exercises on the function and the trophic innervation of the male sexual organs, especially on spermatogenesis, but have also shown the perfect sensibility of the genetic centers. In these animals these centers are more evoluted and also show more seriously acute signs of involution than the partial lesions of the cerebrum can give rise to independently of the general disturbances following the trauma.

The researches in dogs serve to better define the site, not of all, but of the principal, genetic centers in the cerebral cortex. These cannot be said to be localized in a circumscribed zone but are diffused through the whole cortical mass of both hemispheres in such a way that normally their specific action cannot but be interpreted as the resultant of a stable equilibrium of synchronous and complex function of varied genetic energy (4).

The importance derived from the existence of higher centers governing the more complex phenomena of procreation, lies in the fact that it establishes this as one of the higher functions of the cerebrum; but it can be disturbed by dynamic disturbances and, therefore, independently of the state of integrity of the brain and hence of the very genetic centers themselves.

To decide this question, investigations were made on the effects on the genital organs of such substances as act notably on the cerebral cortex, especially *caffein*, *veronal* and *absinthe* (5); but, as in these cases, it is not easy to separate the direct action from the indirect action of the toxic substance on the genital organs, we had recourse to cerebral excitation, to cerebral traumatic shock in the broad sense of the word; that is to say, we caused disturbance or arrest of the various cerebral functions without any alteration in the nervous tissue itself.

My purpose in the researches was, therefore, to produce experimentally cerebral excitation of various degrees in adult animals and possibly in full sexual activity, endeavoring, at the same time, to conserve as much as possible the integrity of the nervous tissue, afterwards preserving the genital organs in order to study the nature and the characters of the functional and trophic disturbances that eventually occur.

As is known physiologically, the severity and the duration of cerebral excitation vary in the different species of animals and are always greater as we ascend the zoological scale. I believe it advisable to experiment contemporaneously on lower vertebrates to the extent that I have on higher, particularly on fowl, guinea-pigs and dogs.

To succeed in the first part of the experiment, that is to say, to produce traumatic cerebral excitation and at the same time to leave the nervous tissue as intact as possible, recourse was had to striking the animal's head with a stick with sufficient violence to obtain complete *shock* in a manner which will be described separately for each species of animal.

Added to the report of these experimental investigations will be an anatomic-pathologic report from quite an important case of a young man, who died with symptoms of grave cerebral excitation in consequence of a violent blow on the head with a stick. This case is of singular value, especially because of the nature of the report which, as we will see, agrees exactly with the experimental findings. It was the subject, afterwards, of one of my studies in conjunction with Prof. Di Mattei and Murgia and presented before the Court of Justice of Cagliari in 1911.

Finally, the results of a new series of researches on roosters and dogs will be taken up, which were performed for the purpose of studying the specific toxic properties of the blood of animals with cerebral excitation in an inquiry into an interpretation of the results of the first.

All the material for histologic study was prepared with various fixing solutions, preference being given to formalin, Fleming's solution and Bouin's solution. The preparations were stained with iron-hematoxylin and eosin and with elective methods for the chromatin in mitosis, *i. e.*, with Pianese's method, the method of Biondi-Heidenhen, but especially with my method of triple colorization which has the prime advantage of a constant viscosity and an easy application to sections treated with the improved fixing solutions for a long time (especially with formalin and with Bouin's soluton.)*

With this method the protoplasm is stained violet; the chromatin at rest, dark blue; the chromatin in mitosis, ruby red. This method shows well the heads of the spermatozoa in all stages of evolution as well as any functional aberrations of the seminal cells, as I have already demonstrated in a special paper (6).

Part I. Researches on Roosters.

These researches were made on adult roosters about a year old and in the spring, during the period, that is to say, of their maximum sexual activity. To obtain, in these animals, a severe cerebral excitation without injury to the nervous tissue, they are struck repeatedly on the head with a stick wielded with adequate force. With all that it is difficult, at one attempt, to produce in them a severe excitation with paralysis and complete loss of consciousness sufficient to last for a time. In cases where the maximum excitation is obtained, the animals recover completely in a few minutes and quickly resume walking and eating as before. To produce in this species of animal phenomena of severe cerebral concussion of long duration, the trauma must be repeated many times at different sittings at intervals of from 12-24 hours, according to the severity of the general disturbances provoked which are always in direct proportion to the number of the excitations.

Finally, to obtain cerebral excitation and avoid possible complications which can alter the course and the issue of the investigation, the blow must be struck on the more anterior part of the head, thus avoiding any trauma to the posterior part of the brain corresponding to the location of the more vital and sensitive centers, or compressing the optic thalamus. Such lesions easily cause severe convulsions ending in the death of the animal.

Only with this mode of procedure in this species of animal can severe and lasting excitation be obtained with many analogous characteristics to that obtained ordinarily in higher vertebrates.

Generally after 5 or 6 sittings the roosters pass the first stage of *shock* and enter a state of general stupefaction that will last for several hours and sometimes a day. In this condition they eat little, walk with difficulty, stagger and jump; they cease to crow and lose every sexual instinct and their external sexual characters.

It is now necessary to refer to the results obtained in roosters subjected to traumatic cerebral excitation of different degrees and explain the findings in a series of investigations performed upon subjects in which the excitation was provoked once only and which was, therefore, slight and of brief duration. Then will follow the findings in a second series of experiments performed upon subjects in which, by means of trauma in diverse locations, a cerebral excitation was obtained of long duration, protracted for a period of more than a week.

Lastly, we will explain the findings in a third series of experiments performed for the purpose of establishing, at least approximately, the maximum duration of the effects of considerable and prolonged cerebral excitation in this species of animal and also for a control, at least macroscopically, as to the condition in which the internal genital organs are found at various periods subsequent to the trauma.

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*Immerse the section for 15-20 minutes or longer in a mixture of alum-hematoxylin (1 part) and a saturated solution of basic fuchsin (3 parts). Decolorize rapidly in 95 per cent. alcohol. Wash in water for 15-20 minutes. Dehydrate in absolute alcohol. Clarify in xylol and mount.

First Series of Experiments.—Three roosters, each ten months old and weighing about 1,300 gms., were rendered insensible by repeated blows on the head with a stick. In this state of cerebral shock the animals remained for about 20 or 25 minutes and not longer than an hour later they walked, ate and crowed as before. These roosters were killed, respectively, 5, 7, and 10 days later. The brain was of normal appearance as also the testicles which were of equal volume and weight as those of roosters killed contemporaneously for purposes of control. The average weight of the testicles, both experimentally and control, varied from 27 to 28 grammes. These organs were compared under perfectly normal conditions and found under microscopic examination in vigorous spermatogenesis.

The results of the first series of experiments were, therefore, entirely negative.

Second Series of Experiments.—In five roosters, varying in weight from 1,200 to 1,300 grammes and each about 10 months old, cerebral shock was induced every 12 hours for several consecutive days. The animals were killed 18 days after the last trauma when they had returned to excellent general condition and had regained or surpassed their previous weight.

(a) Two of these roosters were traumatized respectively for 2 or 3 consecutive days. About 30, or at most, 40 minutes after each single shock they rapidly recovered either entirely or almost entirely, as those in the preceding series; in the intermediary period they showed little or no difference from the controls. They were lively and ate plentifully. In the first days they lost respectively 110 and 135 grammes in weight, which they rapidly regained; in fact, they increased in weight during the latter days of the experiment. During the whole of this period they continued to crow, maintained their sexual instinct towards the hens and retained nearly unchanged their secondary sexual characters, preserving equally well the expansion and congestion of the wattle and the comb, as in the controls.

At autopsy these animals showed nothing noteworthy in the brain or in the other internal organs. The testicles were reduced to about half the normal volume with a loss in weight of 15 and 14 grammes respectively, that is to say, half the weight of the controls.

Microscopic examination of the testicles and the seminiferous tubules showed roundness and fullness as in normal conditions, but the transverse diameter was somewhat reduced. Their contents were abundant and composed of various epithelial elements regularly disposed in layers and of normal structure. The seminal elements were mostly in a state of rest and rarely did they show karyokinesis. The spermatozoa seemed somewhat scarcer than in the control preparations, but they retained their regular disposition in radiating fasciculi. Scarcer still were the spermatozoa lying free in the seminiferous tubules, and those in the afferent canaliculi and the vasa deferentia were always intermingled with normal epithelial elements.

Nothing abnormal was found in the blood vessels.

From the summary of these findings we can therefore conclude that in these two cases there has been a slight functional torpor of the sexual glands.

(b) Two other roosters were traumatized on 5 and 6 consecutive days. In the first days of the experiment, they behaved as did the preceding roosters, maintaining their vivacity, the sexual instinct and the normal characters of the secondary sexual organs, also during the intermediary period in the various states of traumatic shock. Afterwards they withered away rapidly, ceasing to crow, losing every sexual instinct after every single trauma, passing through a brief period of shock, remaining nearly always immobile, drowsy, the feathers in disorder and comb and wattle anemic and withered. They still react quickly, however, to stimuli, leaping and walking staggeringly. These fowls resume eating two or three days after the last trauma, but afterwards they recover rapidly, re-acquiring their vivacity, walking normally, and feeding abundantly, but they do not recommence to crow, have lost their sexual instincts, their comb and wattle remain anemic and shrivelled and their feathers have lost their typical metallic iridescence.

When these animals were killed they weighed as much, in fact, more than at the beginning of the experiment.

Autopsy showed nothing abnormal in the brain or in the other internal organs. The testicles were greatly reduced in size, more anemic and firmer than normally and weighed respectively 2.8 and 2.3 grammes.

Histologic examination of the seminiferous tubules showed them round but of reduced size. The contents were scarce and consisted almost exclusively of spermatogenic cells and cells of Sertoli, the former with atrophic nuclei and in a state of pyknosis, the latter containing nuclei of a vesicular aspect with few but large chromatin granules. Spermatocytes were quite rare and rarer still were spermatids. These were pale and in a state of rest, contorted irregularly and provided with a vesicular nucleus poor in chromatin elements. Quite frequently the seminal cells, mother cells and daughter cells were in a state of *synapsis*. Besides these there were present, though rare, spermatic cells in a condition of karyokinesis, usually arranged in small groups.

The karyokinetic elements were confined entirely to the mother seminal cells. The daughter cells were of usual size and assumed an irregular form with a more granular and better staining protoplasm than normally. The nuclei of these elements formed mitotic figures, not always regular and typical, but frequently irregular and composed, above all, not of many masses of chromosomes but of a single homogeneous chromatin mass. The elements formed various atypical forms which greatly resembled the *aster* and *diaster*, evidently degenerated before attaining the telophase. These are polymorphic chromatin masses of either round or irregularly radiating forms, or straight or horse-shoe shaped forms. The masses, however, retain the microchemical reactions of chromatin substance in mitosis, staining intensely with various nuclear stains and reproducing the coloration of each staining solution. They also retain the elective properties of the specific stains and, hence, they could be brought out with the Biondi-Heidenhain method, the Pianese method and especially with my own method of alum-hematoxylin and basic fuchsin being thus stained an intense ruby red, just as karyokinetic forms normally. It is only in cases of much advanced degeneration that the chromatin mass loses its staining properties together with the elective substance of the chromatin in mitosis whereas they always stain intensely with the various nuclear hematoxylins.

The mitotic forms are found intermixed with cellular detritus in the lumen of the seminiferous tubules, also in the afferent canals and in the deferential ducts. The two last-named canals are lined with epithelial cells, the protoplasm of which has an hydropic and turbid appearance and the nuclei have lost their typical granular aspect and tend to stain in a homogenous way.

Of the interstitial cells, some are normal; others seem pale and show a nucleus that is slightly wrinkled and in chromatolysis.

The blood vessels show nothing noteworthy.

The complete arrest of spermatogenesis is therefore evident in both cases from the condition of involution and severe functional torpor of the seminal elements.

(c) A rooster was traumatized on 8 consecutive days every morning and evening. It showed the same phenomena as the animals in the preceding experiments and perhaps in a more aggravated manner. Every time the animal suffered the trauma, also in the latter days of the experiment, it recovered sufficiently to be able to walk around for about one hour, then it entered a state of severe torpor in which it remained the whole day. During this period it could not support itself and when stimulated, would walk in a swaying fashion and would hop and jump. The rooster, however, rapidly recovered, became lively and ate plentifully. He did not resume crowing, showed no sexual instinct and his comb and wattle were anemic and shriveled. From day to day, until the time he was killed, he increased in weight until he finally weighed 150 grammes more than at first.

At autopsy nothing important was found in the brain or in the other internal organs. But the testicles were enormously reduced in size, quite firm and weighed altogether 2 grammes.

The histologic picture of these organs was almost identical with that in the preceding cases; that is to say, an enormous reduction in the diameter of the seminiferous tubules, the contents of which were almost exclusively composed of fundamental elements (cells of Sertoli, spermatogons) and an absence of spermatozoa. In this case also the greater part of the seminal elements showed nuclei in pyknosis or in a state of rest; then there were mitotic forms which were very scarce, atypical and involuted as in the preceding cases.

The epithelial elements of the afferent tubules and of the tubuli deferentes, were diminished and piled up so as to form a layer more compact than usually. They showed slightly oval nuclei staining uniformly with hematoxylin. Many of the interstitial cells were in chromatolysis. The vessels were practically normal.

In this case also we find, therefore, a severe, acute atrophy of the sexual glands with complete arrest of spermatogenesis.

Third Series of Experiments.—In the spring, as in the preceding experiments, two roosters, each about one year old and weighing 1,450 and 1,420 grammes, were traumatized on 7 successive days and allowed to survive. During the experiment, these animals showed the same phenomena as described in the second series of experiments: emaciation, a state of depression in the latter days of trauma, difficulty in standing and in walking, atrophy of the comb and wattle, cessation of crowing and disappearance of sexual instinct. These two roosters also recoverd rapidly a few days after the last trauma, regained their appearance, their liveliness and their weight as before, but the comb and wattle remained atrophied and anemic, they stopped crowing and showed no indication of any sexual instinct.

At this time, by means of an abdominal incision, the testicles were examined. They were found greatly atrophied in both cases, and corresponded in appearance and volume to that of the last rooster in the preceding series of experiments, which was killed 18 days after a period of 8 days of repeated cerebral excitation.

After the abdominal wound was closed, the condition of the two roosters remained excellent and in two months they had gained 280 and 360 grammes in weight respectively. At this time the animals had for some days recommenced to crow, to molest the hens, and regained the external sexual characters (congestion of the comb and wattle).

These roosters were killed in the month of May while in excellent general condition, one of them 60 days, the other 80 days after the last cerebral excitation.

At autopsy the testicles were found notably increased in size in both roosters, in contrast with the findings by abdominal exploration, weighing respectively 17.60 and 19.50 grammes.

Histological examination of these organs showed them to be in a perfectly normal condition, with the seminiferous tubules filled with seminal elements in exuberant spermatogenesis.

It is evident that in these two cases the sexual organs which, from repeated cerebral excitation, had at first become greatly atrophied, returned later to a perfectly normal anatomic and physiologic condition. Contemporaneously also the secondary sexual organs recovered their normal aspect and the sexual instinct reappeared.

The following experiment was repeated on roosters in a corresponding season of minimal sexual activity, that is to say, in the late autumn.

Two roosters, each one year old and weighing 1,400 and 1,450 grammes respectively, were traumatized twice in 24 hours, for a period of 7 consecutive days.

They became emaciated during the first days, but afterwards, upon cessation of the trauma, they recovered rapidly and in about 17 days had regained their former weight. At this time their testicles, explored through an abdominal incision, showed a high grade of atrophy, *i. e.*, a volume corresponding approximately to a total weight of 2.50 grammes.

About a month after the suspension of the trauma, these roosters had re-acquired their sexual instinct and the normal characters of the secondary sexual organs, which had disappeared in the first days of the experiment.

They were killed while in excellent general condition, one of them 15 days, the other 30 days later, and the testicles appeared to be larger than they were shortly after the trauma, but nevertheless reduced to about one-half the volume that they are normally in spring, weighing 14 and 15 grammes respectively. The structure was normal, but spermatogenesis was not very active.

Evidently, therefore, in these two roosters the testicles, after about one month, had re-acquired their normal anatomic and functional characters. If the volume and weight of these organs in this experiment are below that in the experiment in the spring, it is probably due to the fact that this experiment was performed at a time of physiologic rest of the genital organs when the testicles are normally inferior in size and weight to what they are during the period of maximum activity, *i. e.*, in the spring.

Part II. Researches on Guinea-Pigs.

Guinea-pigs, like roosters, are quite resistant to cerebral excitation. The effect is very brief and lasts not more than 10-15 minutes, permitting a rapid and complete recovery of the animal. If the excitation be provoked on several consecutive days, at intervals of 24 hours, the effect lasts longer and produces a general decline in the animal characterized by a state of general torpor following the *shock*, continuing for some days after cessation of the trauma.

In cases where the excitation is induced on several consecutive days the animals, moreover, almost always sustain general epileptiform convulsions, sometimes very severe and frequently fatal.

The experiments were performed on 30 full-grown male guinea-pigs, each weighing more than 500 grammes, after having determined with some preliminary tests that severe cerebral excitation repeated for 3-4 consecutive days could be tolerated by this animal without causing any functional disturbance in the sexual organs.

They were divided into two groups of 15 each. The first group were subjected to cerebral excitation for 8, and the second group for 15 consecutive days. Of those in the first series 9 survived the experiments; of the second only 6 survived.

The survivors of the first group during the experiment lost from 100 to 150 grammes in weight; those of the second group lost from 150 to 200 grammes and more. Neither those of one or the other group were completely restored, but did regain their original weight about 20-25 days after the cessation of the trauma.

Some of these animals finally died in the epileptiform attacks in the first ten days subsequent to the experiment, and the remainder were killed later at different intervals.

Of those in the first group that died or were killed in the period from 5 to 30 days later, not one showed any noteworthy changes, neither macroscopic nor microscopic, in the testicles or the adnexa. Spermatogenesis was always abundant as in the controls, except in one case which was evidently more torpid but without any other noteworthy finding.

Of those in the second group one that died 6 days after the experiment showed the testicles in almost normal condition; but three that were killed 14, 18 and 19 days, respectively, after the experiment showed the testicles less firm and of a muddier appearance than normally.

Microscopic examination of these organs showed an insufficiency in spermatogenesis in the greatest part of the seminiferous tubules and a complete suspension of it in others. The latter were confined in a more or less diffuse zone centrally located, containing not only cells of Sertoli, often hypertrophied, but also mother seminal cells, involuted and with pyknotic nuclei. Groups of tubules in complete rest were found also in the organs of the control animals, but they were very few and always surrounded by other tubules in active spermatogenesis.

In these three experimental animals mitosis was scarce everywhere, but, as in the involuted testicles of the rooster, synaptic forms were quite abundant. In the afferent tubules, epididymis and vasa deferentia the epithelial cells lining the lumen were cloudy, hydropic and with the nuclei in a condition of chromatolysis; and the lumens filled with spermatozoa and cellular debris. The interstitial cells and the vessels of the testicle were everywhere of normal appearance.

The last two guinea-pigs, killed 30 and 32 days after the experiment, showed the testicles and adnexa perfectly normal and with abundant spermatogenesis. Evidently, in these two cases the effects of repeated excitation were null or more likely, they disappeared in time followed by functional re-integration of the organs as has already been seen in roosters and, as we will see later on, in dogs.

Part III. Experimental Investigations on Higher Vertebrates.

The experimental investigations in this section were performed in the spring upon 27 dogs of 1½-2 years of age. They were healthy and their genital organs were normally developed. Of these animals 5 served as controls and the other 22 were used to study the effects of cerebral excitation on the testicles.

Trauma was always produced by striking the head of the dog with a stick with varying force so as to obtain phenomena of cerebral excitation of various degrees, slight or severe, according to the case, but not compromising the life of the animal.

The actual experiments can be divided into two distinct series, according to the severity and the duration of the excitation.

First Series of Experiments.—The experiments were performed upon 4 dogs in which a slight cerebral excitation was induced, *i. e.*, an excitation of the first degree. The animals showed signs of general paralysis or of slight paresis. They did not lose consciousness completely but were only stunned. In this condition the animals remained for one, two, or, at most, three hours, but afterwards they recovered rapidly and completely and in the same day regained their activity and appetite. The dogs were killed 7, 8, 10 and 12 days, respectively, after the cranial trauma.

At autopsy nothing abnormal was found in the brain or in the other internal organs including the testicles which retained their normal appearance and consistence.

Histologic examination of these organs showed them to be in perfectly normal condition and all in active spermatogenesis, as were the controls. The afferent tubules, the epididymis and the tubuli deferentia were normal.

The slight cerebral excitation did not produce in these dogs, therefore, any appreciable disturbance in the function of the testicles and the adnexal organs.

Second Series of Experiments.—Severe cerebral excitation of long duration was produced on 18 dogs. The animals fell in a state of general paralysis with complete loss of consciousness and remained in this condition for from 20 to 24 hours. In some cases, where the animals were especially resistant, they recovered rapidly and completely after a brief period of shock. The trauma was repeated a second time on the same day or on the following until the desired result was obtained. When the period of shock was over, each of the dogs recovered gradually; it took four, five and eight days before they had completely recovered from the general disturbance.

Subsequent to the period of traumatic shock the animals remained in a condition of more or less marked stupor, eating little, emaciating, having general tremors, walking with difficulty and staggering. Less frequently the paralysis persisted during this period, usually of a spastic nature and affecting, above all, the upper limbs. In one case the trauma caused a cranial fracture. In no case were there convulsions or other complications.

The animals were afterwards killed in different groups and at different intervals. Some were lost in the first days after the trauma from general disturbances due to shock, others were killed later in the absence of these general disturbances and others still later when they had returned to good general condition and had regained their liveliness as at first.

GROUP 1.—Two dogs were killed 4 and 5 days, respectively, after the trauma but they were still in a condition of torpor and showed considerable disturbance of motion. No cranial fracture was found at autopsy. The brain appeared to be intact but there was edema and general stasis. In one case there were small punctiform hemorrhages corresponding to the right temporal zone. There was nothing noteworthy in the other internal organs including the testicle which had a normal appearance and consistence.

The testicles of these dogs were found to be normal also upon microscopic examination. The seminiferous tubules were filled with epithelial elements of normal structure, regularly disposed in layers. Spermatozoa were abundant and as in the controls they formed radiating columns. The free spermatozoa were intermingled with cellular debris, quite abundantly in the lumen of the seminiferous tubules and in the ducts of the epididymis and vas deferens. The epithelial elements were always normal. The blood vessels seemed fuller than ordinarily.

GROUP 2.—Five dogs were killed quickly after they had completely or almost completely recovered from the shock; the first at seven, the second at eight and the others at nine days after the trauma.

Autopsy in one case showed a fracture of the skull. The brain seemed intact and everywhere of normal appearance with the exception of two dogs, in which a hemorrhagic focus the size of a lentil was found superficial to the base. The testicles in three cases were of almost normal consistence, but in two cases they were softer than usual.

Microscopic examination of the testicles varied considerably in the different dogs. In the dog killed 7 days after the trauma the seminiferous tubules were round, but their contents were very scanty. Particularly the seminal elements of the more superficial layers and more especially the spermatids were absent. The spermatozoa were very scarce and what was present was disseminated irregularly between cellular detritus and masses of chromatin granules of various sizes which occupied the lumen of the tubules.

Of the seminal mother cells (spermatogon cells), some were in a state of rest, others showed protoplasm that stained more intensely than ordinarily and having also atrophied and pyknotic nuclei; still others were in a condition of *synapsis*. In these cases karyokinetic forms were very rare.

The seminal daughter cells, above all the spermatocytes, were, in the majority of the cases, of normal form, with their elements in a state of rest but with very little chromatin substance. Their nuclei seemed more vesicular than ordinarily. Among them, elements in *synapsis* were very frequent which, in some tubules, assumed such proportions that they constituted the only histologic picture. In such cases there were not only seminal daughter cells but also mother cells in *synapsis*. The epithelial elements were in normal condition; the chromatin substance, in these cases, accumulated in a point of the nucleus assuming the unusual appearance of a compact and homogenous mass resembling a nucleus in advanced pyknosis. Not rarely the protoplasm of these cells showed notched contours and the characters of true disintegration.

Among the seminal daughter cells and more exactly of the deeper strata, i. e., among the spermatocytes, there were mitotic forms, some disseminated, others arranged in small groups, which were in prophase and in metaphase, the chromosomes having attained the phase of maturity and showing all the normal morphologic and microchemical characters. They were round and stained deeply with the elective methods, and particularly with my method of alum-hematoxylin and basic fuchsin.

Among the elements in prophasic and metaphasic mitosis there were some atypical forms, as compared with the control preparations, which, from the abnormal condition of the cytoplasm and the idioplasm, merit special consideration. The size of these atypical seminal elements was increased, their cytoplasm, in general, was cloudier and more granular than usual and they have lost every trace of a centrosome and of the spindle. The idioplasm showed morphologic modifications of a special kind that would denote an abnormal evolution.

The single chromosomes, while retaining their typical microchemical reactions, have in these cases lost their round form and homogenous appearance as shown normally when they reach maturity. They appear as ovoid-angular corpuscles, slightly larger than normal and constantly furnished with an unusual central halo and indistinct contours but paler than the remaining parts.

These chromosomes, in the first period, appear grouped in the center of the nucleus which is swelled up (exaggerated prophasic swelling) or else they appear in the center of the cytoplasm according to the form, prophasic or metaphasic. Afterwards, in the more evoluted form in prophase, the chromosomes first invade the whole nucleus and then the cytoplasm. In the metaphase, however, the chromosomes invade the cytoplasm directly.

The atypical chromosomes invade the cytoplasm and also undergo later morphologic modifications. They assume ovoidal forms, a little flattened with a tendency to discoidal shapes and show a pale and unstained central halo, the contours of which are always well delimited as in the preceding cases. The cystoplasm of these elements also undergoes evolutionary changes, particularly increase in volume to double the size as well as other abnormal changes.

These atypical seminal forms, more evoluted than those usually found in the more superficial epithelial layers, are quite scarce in this instance but more abundant, as we will see in the subsequent cases.

The cells of Sertoli appear with well preserved nuclei, in clearly vesicular forms, always a little larger than ordinarily, and containing but few chromatin granules, but these are larger than normally. They are provided with abundant protoplasm which forms coarse, interlacing strands between them and which invade the lumen of the tubules.

In the afferent tubules and especially in the ductus epididymis and the ductus deferentes there are to be found a few spermatozoa intermingled with abundant cellular debris. The epithelium lining the tubules seems to be in almost normal condition, and only in some points shows an incipient chromatolysis. There is nothing abnormal in the interstitial cells or in the blood vessels of the sexual organs.

In the dog killed on the eighth day after the trauma and in the one killed on the ninth day, histologic examination proved almost entirely negative. The seminiferous tubules were filled with normal cellular elements and the spermatozoa were plentiful and arranged regularly in tufts. The interstitial cells, the epithelium of the ductus epididymis and of the ductus deferentes appeared normal.

In the other two dogs killed on the ninth day after the trauma, histologic examination was positive and showed involution characters more evident than in the first case, i. e., the dog killed on the seventh day. In both cases, in fact, there were the characters above described of an arrest of spermatogenesis with involution of the greatest part of the sexual elements. In one case especially, the atrophy of the testicle appeared to be very severe, so that in many places the contents of the seminiferous tubules seemed to be made up almost exclusively of spermatogenic cells and cells of Sertoli, but spermatozoa were very scarce or absent altogether.

In this case the seminiferous tubules behave differently after cerebral excitation, at least in the first days, varying notably especially in degree and in the phenomena of involution in different parts of the organ. In fact, irregularly disseminated amongst the seminiferous tubules in apparently normal condition as regards the number and condition of the sexual elements, we can distinguish other tubules in which the involution is incipient and still others where it is of an advanced grade. The sexual mother cells (spermatogons) in the greater part of the latter tubules are somewhat diminished and have a dense, homogenous protoplasm staining deeply with eosin, but their nuclei are more or less completely pyknotic. Quite frequently, also, the sexual mother cells are in *synapsis*, but very few are in mitosis.

Among the sexual daughter cells, in greater part involuted as in the preceding case, forms in mitosis are found which assume the atypical prophasic and metaphasic forms, described above, confined mostly to the deeper strata.

In the more superficial strata in this case there were found atypical forms, particularly among the spermatocytes, of much more considerable size than in the preceding case. These were manifested in the form of large cells having a cloudy and granular protoplasm in which were disseminated round and spindle-shaped chromatin corpuscles. These chromatin corpuscles, when seen flat, looked like uniform discs of about 2 microns in diameter provided with a clearer and well limited central zone; but when seen in profile they were biscuit or semilunar in shape.

These corpuscles possess the mirochemical reactions of chromosomes and can be easily demonstrated with the elective stains, and especially well with my triple colorization method of alum-hematoxylin and basic fuchsin, by means of which the stain is always intensely ruby-red. For more detailed particulars regarding these forms of atypical seminal cells the reader is referred to my work cited above (reference 6).

In some cases the chromatin substance is fused into two or three round homogeneous masses which not rarely retain the microchemical reactions of chromosomes.

The forms in *synapsis* are always quite plentiful amongst the seminal daughter cells, as they were in this case. And in many tubules in which they are exceedingly numerous these elements always show characters of true involution, more or less marked. Their cytoplasm is pale, their contours disrupted, but the chromatin substance appears fused into a single homogeneous mass.

The spermatozoa, in this case, were quite scarce and could be observed only in the lumen of the tubules intermingled with cellular detritis. The cells of Sertoli were always well preserved and always showed hypertrophic characters that were more or less accentuated. Nothing of note was to be observed in the interstitial cells or in the blood vessels.

In this case, therefore, the same phenomena as described in the case of the dog killed 7 days after cerebral excitation, were to be found with the sole difference that here the processes of involution were more advanced.

Finally, the involution of the genital organs in this case is more evident also in the afferent tubules, in the epididymis and in the ductus deferentes; the epithelial elements are paler than ordinarily and have acquired, including the borders, a cloudy, almost hydropic aspect. Their nuclei appear poor in chromatin granules and stain lightly and diffuse so that they can easily be confounded with the cell-bodies themselves.

GROUP 3.—Three dogs were killed about a week after recovery from cerebral excitation and 15, 18 and 19 days, respectively, after the trauma. At autopsy the brain was intact and there was not a single lesion in either of the dogs. No gross changes could be observed in the testicles.

Microscopic examination of the testicles of the first two dogs was positive, showing this organ acutely atrophied, of a higher degree than in the preceding cases, but in the third dog, i. e., the dog that survived longest, the examination was practically negative, the testicles being almost normal and with sufficiently active spermatogenesis.

In the first two, *i. e.*, positive cases, the involution of the testicle could be seen to have been of the same degree; the seminiferous tubules retained their round form, but their contents consisted predominantly of seminal mother cells and cells of Sertoli.

In both cases the absence of any trace of spermatozoa was noticeable, probably because in the course of evolution the spermatids are usually absent entirely and the tubules in which they exist are deformed, having indistinct ragged contours and disintegrated nuclei. They are, therefore, irregularly scattered in the tubular lumen intermingled with cellular debris and fatty granules of various size. The spermatocytes are also scarce and usually deformed, the protoplasm being pale and vacuolated and the nucleus vesicular and poor in chromatin.

Amongst these elements are others of different forms with protoplasm staining deeply with eosin and with pyknotic and multiform nuclei, representing deformed and degenerated mitotic figures which usually appear in the form of the aster and the diaster. But normal mitotic forms are always scarce and confined ordinarily to the mother cells. In this case they were very scarce and elements in *synapsis*, which were frequently present in the preceding cases, were here absent altogether.

In the first dog of this new group of experiments, i. e., the dog that lived for 15 days after cerbral excitation, spermatocytes in mitosis were found with great frequency that were arrested in the stage of the prophase or of the metaphase and were transformed into the aberrant forms described in the preceding cases, with swelling and cloudiness of the cytoplasm and transformation of the chromosomes into ovoid-angular or discoid chromatin corpuscles about 25 or 30 in number.

Quite large atypical seminal elements were found, also, in this case, lying free in the lumen of the tubules. These usually had the appearance of giant cells with discoidal chromatin corpuscles disseminated through the protoplasm which retained the microchemical reactions of the chromosomes. In some cases the protoplasm of these aberrant elements was more or less vacuolated, but the chromatin corpuscles showed a central zone which tended to stain with either acid or basic stains (eosin, acid fuchsin). The staining was always light and uncertain, as we will see more definitely in the subsequent cases. In the more superficial epithelial layers and in the lumen of the tubules of the testicles there were frequently found large rounded masses of protoplasmic substance staining homogeneously and deeply with eosin and containing numerous nuclei of spermatids having an hydropic appearance and disintegrated chromatin. These were irregularly disseminated here, confluent there, in the center of the protoplasmic mass. There were also pseudo-giant cells evidently constituted of several spermatids fused together, arrested in their evolution and stricken by a colliquative degenerative process.

In all these cases the cells of Sertoli seemed hypertrophied, usually provided with large protoplasmic tendrils and with a nucleus denser and more shining than usual.

Nothing of note is to be seen in the blood vessels. The interstitial cells show a nucleus poorer than ordinarily in chromatin substance—in others the nucleus shows incipient chromatolysis.

Group 4.—Three dogs, in excellent general condition and about one week after complete recovery from severe cerebral excitation were killed respectively 20, 21 and 22 days after the trauma.

At autopsy, the brain as well as the internal organs were normal. Only the testicles of the first dog seemed less firm than normally.

In the first two cases histologic examination of the testicles showed them to be almost normal and with abundant spermatogenesis. The afferent tubules of the epididymis and the vas deferens in these cases appeared to be normal.

In the third case the genital organs showed the more typical characters of acute atrophy. The contents in the seminiferous tubules were quite scarce and consisted of seminal cells, some of them in a state of rest, others in a state of pyknosis, and still others in mitosis. Of the latter many were in a condition of incipient and advanced involution. Synaptic forms were absent in this case as well as any trace of spermatozoa.

However, the more important feature in this case was in the excessive number of aberrant seminal elements in part with atypical characters of mitosis, as already described above, and in part with new characters representing a successive stage in their evoluton.

Thus all these atypical forms are found not only among the spermatocytes but also among the spermatids although more rarely. It is a question of seminal elements that have been arrested in their physiologic evolution during the prophasic or metaphasic stage and which have undergone suddenly the metamorphosis described above.

The spermatids follow the same fate as the spermatocytes; they enlarge to two or more times their normal size, their protoplasm becomes cloudy, their chromosomes are transformed into the characteristic ovoid-angular or discoid shape with a diameter of about 2 microns, as in the case of the spermatocytes. The number of these chromatin corpuscles in the aberrant spermatids is rather small and varies usually from five to seven, but in the spermatocytes they vary from 25 to 30 in number.

In this case also free aberrant forms lying in the seminal tubules were frequent. These usually were large cells with cloudy and granular protoplasm in which were disseminated *discoid* chromatin corpuscles which always showed the microchemical reactions of chromosomes. These atypical free-lying cells differ from the preceding cases either in the special condition of the cytoplasm or the chromatin corpuscles. In some cells, in fact, the cytoplasm is uniformly cloudy and granular; but the chromatin corpuscles of the discoid form become elliptical or club-shaped and resemble the head of the spermatozoon of the dog in the course of evolution or already in maturity. This form always retains the microchemical reactions of chromosomes and the head of the spermatozoon, the borders staining more intensely than the central portion. The size of the elliptical or club-shaped chromatin corpuscles corresponds very nearly to that of the heads of spermatozoa in the various stages of evolution. Usually these corpuscles in every single cell show the same degree of evolution; more rarely they show the various phases of the passage from the typical discoid form to the club-shaped (clavated) form.

Sometimes these aberrant cells show a vacuolated protoplasm more or less in a state of disintegration so that the club-shaped chromatin corpuscles are liberated and enter the lumen of the seminiferous tubules very analogously to what is observed normally in regard to nematosperma in the liberation of the protoplasmic residue of the spermatids.

In other cells an involution of the chromatin corpuscles takes place contemporaneously with the vacuolization and disintegration of the protoplasm. This occurs with constant and typical characters in all cases. The chromatin corpuscles after attaining the discoid form, undergoing in these cases, in fact, a process of involution characterized by a progressive pallidness and diminution in the peripheral portion, that is to say, of the part which at first stains most deeply with basic dyes; but the central portion, that portion which remains unstained, acquires a degree of unusual refraction which always increases and at the same time it stains deeply with either acid or basic stains.

In the cases of the greatest involution of these chromatin corpuscles the peripheral zone disappears entirely or almost entirely, but the central zone becomes transformed into a small, round granule, very refractive, sometimes dividing in two and staining intensely. The stain that these take depends upon whether the staining solution is acid or basic; with eosin and with acid fuchsin the stain will be orange yellow, with basic fuchsin dark red, and with iron hematoxylin dark violet.

It is evident that we are here dealing with a degenerative process of the aberrant chromosomes which from the degree of refringence and from the microchemical characters corresponds to hyaline degeneration.

It is not rare that in addition to the degenerated chromosomes a protoplasmic mass will be found, in more or less advanced disintegration, lying free in the lumen of the seminiferous tubules intermingled with cellular detritus and more evoluted, elliptical or claviform aberrant chromosomes. The reader is referred to my work (6) for a more detailed description either of aberrant chromosomes or aberrant spermatogenesis due to probable hyaline degeneration.

The cells of Sertoli, in this case, also show characters of a moderate hypertrophic reaction and are still provided with a large nucleus and numerous protoplasmic tendrils.

The lining epithelial cells of the afferent tubules, of the epididymis and of the vas deferens contain cloudy protoplasm and a nucleus, which has in great part lost its characteristic round form and granular appearance and has become ovoidal, staining uniformly with hematoxylin, sometimes deeply (state of pyknosis).

There is nothing noteworthy to be observed in the blood vessels of all these organs. The interstitial cells are pale and the nuclei are poor in chromatin.

GROUP 5.—Two dogs in excellent general condition, each showing an increase of 2 kg. in weight, were killed 32 days after the trauma. At autopsy there was nothing noteworthy to be found in the brain or in the other organs. The testicles were softer than normally.

Upon histologic examination the testicles in both dogs showed a high grade of atrophy; the seminiferous tubules were round, but their contents consisted almost exclusively of spermatogon cells and of the cells of Sertoli. Seminal daughter cells were quite rare. Seminal cells in *synapsis* were everywhere either missing or in a condition of necrobiosis as described in the preceding cases. The seminal mother cells and the seminal daughter cells present were, in part, in pyknosis or in a state of rest, and in part, in mitosis.

The seminal daughter cells were represented exclusively by spermatocytes among which, in the first dog, were aberrant mitotic forms as in the preceding cases described, and which were rather scarce or absent in the second dog, also killed 32 days after the cerebral excitation.

The aberrant seminal cells were present in all phases of evolution. The predominating form was that of a large granular protoplasmic mass containing from 25 to 30 chromosomes transformed into discoidal or club-shaped (claviform) corpuscles staining, by basic stains, with their usual intensity. Not a little of this protoplasmic mass was disintegrating and in such a way that the chromatin corpuscles, especially the claviform, were set free in the lumen of the tubules.

Among the seminal cells in disintegration there were also found some with discoidal chromatin corpuscles showing the degenerative characters described above, viz.: a lighter peripheral zone and a transformation of the central zone into a granular, very refringent area giving microchemical reactions analogous to hyaline degeneration. In some cellular elements, in disintegration, in a more advanced state and reduced to a shapeless recticular mass, the degenerated chromatin corpuscles were substituted, one can say completely, by small refracting granules.

Together with these seminal atypical cells, which are three or more times larger than spermatocytes, there were found other smaller cells, about one-third the size of the first, containing 5 or 6 aberrant chromosomes, probably arising from spermatids. Finally, in the more superficial epithelial layers and free in the lumen of the tubules there were large masses of protoplasm, some round, some degenerated, made up of two or more cellular elements. In these masses were chromatin corpuscles, irregularly arranged and in large number, 88-100 and more.

Some rare cases of aberrant cells with enormous swelling of the protoplasm were found also among the spermatogons. But it was impossible to follow the evolution of these.

Present also were swollen seminal elements, with the protoplasm in a state of degeneration, the chromatin substance transformed into a few large, usually homogenous, rounded masses retaining unaltered the microchemical reactions of chromosomes. In cases of advanced disintegration of the cellular body these chromatin masses were lying free in the lumen of the seminiferous tubules, as happens analogously with the aberrant nemasperms. It is a question, therefore, of an anomalous fusion of the chromatin in mitotic activity which has already been described under the name of chromatin degeneration (6).

In this case also the pseudo-giant cells were abundant, consisting of the fusion of several degenerated spermatids with a deeply and uniformly staining protoplasm.

The cells of Sertoli, in this case, underwent the highest degree of hypertrophy as shown best with the triple stain of hematoxylin and basic fuchsin. Their cellular protoplasm appeared very cloudy and more granular than ordinarily, giving off, also, numerous granular tendrils which invaded the tubular lumen, filling it completely. The nuclei of these cells, very swollen, were double their normal size and contained a few but large nucleoli which, with the alum-hematoxylin and basic fuchsin stain, stained deep red but the chromatin granules stained blue.

The afferent tubules and more still the epididymeal duct and the deferens duct are somewhat reduced in their transverse diameters, the lumen being more restricted than normal but everywhere completely free. The cylindrical cells lining these tubules are thinner than ordinarily, their borders being indistinct so that it is hard to distinguish each individual cell. The appearance is that of almost a homogenous zone staining deeply with eosin. The cilia at the internal margin of these cells are separated or detached in the form of a pale slender filament, tortuous and broken and usually truncated at the base.

The nuclei of these cells have completely lost their round form and granular structure and have become ovoidal, more oblong but still they stain deeply and uniformly with hematoxylin (pyknoid degeneration). Moreover they are placed very compactly so as to form a second zone placed more peripherally to the first. The adnexal organs of the sexual glands have also apparently suffered involution, characterized by atrophy and pyknosis of the epithelial elements very analogous to what happens in the membrana germinativa of the ovarian follicles as a result of cerebral lesions (2).

The blood vessels of the sexual glands were almost entirely normal in both dogs; but the interstitial cells showed some characters of nuclear chromatolysis, not in an advanced stage.

Group 6.—Three dogs after they had completely recoverd from cerebral excitation were killed respectively 55, 75 and 85 days after the trauma. They were in excellent general condition and had increased notably in weight.

At autopsy nothing abnormal was found in the brain or in the other internal organs except that the testicles were softer than normally.

In this case the cells in normal mitosis everywhere had the advantage over the atypical cells so that in many tubules the regeneration of the epithelium was completed and there was no trace whatever of spermatozoa. From the complexity of the findings in this case it would seem that subsequent to the involution of the testicles there was a true process of anatomic reintegration of the organ during which the regeneration of the epithelial cells was completed slowly, irregularly and unevenly in various parts of one and the same seminiferous tubule so that normal mitotic forms alternated with aberrant forms.

Pseudo-giant cells were, in this case, also frequently disseminated in the lumen of the tubules represented by large masses of protoplasm, staining uniformly and deeply, vacuolated and containing nuclei of spermatids, particularly those of the first series. These nuclei varied in number and at times were irregularly arranged in the protoplasmic masses, at other times they were confluent in them. They usually had an hydropic aspect showing the chromatin in a state of disintegration; but more rarely they were also arranged in homogenous, rounded masses, staining deeply with hematoxylin and reacting to the specific microchemical reactions of chromosomes.

The cells of Sertoli, also, in the greatest part of the seminiferous tubules were, in this case, almost in normal condition. Only in a few cases did they show the hypertrophic characters described in the previous cases.

The afferent tubules and the epididymis were in normal form and lined with perfectly normal cylindrical epithelial cells. The interstitial cells and the blood vessels were also perfectly normal. This pertains to the dog killed 55 days after trauma.

In the other two dogs, that is to say, those killed 75 and 85 days, respectively, after trauma, the testicles were in normal condition with abundant contents in active spermatogenesis. Abundant also were the mature and free spermatozoa accumulated in the lumen of the seminiferous tubules and in the lumen of the afferent tubules of the epididymis. Every trace of atypical seminal cells was absent. The epithelial cells lining the afferent tubules, the ducti epididymis and deferens, were in perfectly normal condition, as were also the blood vessels and the interstitial cells.

The anatomic and functional restitution in these two latter cases was almost complete in the true sense of the word.

Part IV. Anatomic-Pathologic Investigations.

As stated in the beginning, the anatomic-pathologic investigations were performed on a case of cerebral trauma in a boy who died in the surgical clinic of the University of Cagliari and was the subject of a medico-legal paper by me.

Secci Raimondo, of Siapiccia, Province of Oristano, 18 years of age, of robust constitution and in perfect health was on October 29, 1910, attacked by his companions for purposes of theft and struck on the head violently with a stick. Three days later he fell into coma and showed a severe ecchymosis on the head (right parietal region), complicated with a slight depression of the skull. Being in epileptic convulsions as a result of the trauma, the patient was brought to the surgical clinic of the Royal University of Cagliari where he remained in a state of coma interrupted by brief periods of consciousness. He was operated upon for cranial fracture after which he showed some signs of improvement, but he died on November 22, 1910, *i. e.*, 22 days after the assault.

At the autopsy performed by Prof. G. Tarozzi, then Director of the Royal University Institute of Pathologic Anatomy, the brain was found intact except in the region corresponding to the fracture, the right superior Rolandic region, where the cortex was covered with various but slight superficial abrasions. The encephalic mass showed edema and diffuse circulatory stasis and moderate bloody exudation in the lateral ventricles.

There was nothing noteworthy in the other internal organs. The testicles were very flaccid and soft on cutting.

Histologic examination of the seminiferous tubules showed that in part they had retained their round form. Their contents were everywhere very scarce and composed of elements irregularly distributed in the peripheral portions of the tubular lumina which were filled with large masses of cellular detritus.

The seminal daughter cells, above all the spermatids, were very scarce but very few retained their normal form and structure. They showed various grades of disintegration characterized by loss of contour, particularly, with paleness and vacuolization of the protoplasm or with the protoplasm and nuclei poor in chromatin and frequently in chromatolysis.

Amongst these disintegrating elements were many others in *synapsis*, as also rounded forms were distinct contours, with dense, homogenous protoplasm and atrophied nuclei usually irregular in shape, and in complete pyknosis, corresponding to degenerate mitotic forms. The spermatids were very scarce, and spermatozoa were missing altogether.

The seminal mother cells rarely retained their normal granular appearance; for the most part they appeared in *synapsis* or else they were atrophied, their protoplasm being dense and their nuclei in pyknosis. Forms in normal mitosis were entirely absent in this case among the seminal mother cells as well as the seminal daughter cells. Atypical mitotic forms were also absent (aberrant seminal cells) in contrast to the frequency with which they were encountered in the dogs, especially in those that were allowed to survive longest and killed after they had regained their former excellent general condition.

In S. R., who survived 22 days after the trauma, but who was always in a state of coma, the anatomic-pathologic findings have great analogy with those in the dogs killed a few days after the trauma and when they had not yet recovered from the general disturbance. I emphasize this particular above all, because of the importance that it has from a medico-legal point of view, as we shall see presently.

The cells of Sertoli, especially in some tubules, showed the characters of an active reaction with hypertrophy of the nucleus and of the protoplasmic mass, although not very pronounced. Most characteristic were some large protoplasmic tendrils, granular in appearance, concealing, in part, the already reduced seminal epithelium.

The blood vessels were normal everywhere and some of the interstitial cells also retained their normal structure, while others possessed a nucleus poor in chromatin.

The afferent tubules, epididymis and vas deferens were filled with epithelial cells, the nuclei of which had lost their typical granular appearance and were cloudy as in the first phase of pyknoid involution described above, especially in the dogs. No spermatozoa were found in the lumen of these tubules but in some in the epididymis, accumulations of cellular detritus were specially abundant.

In the adnexal organs of the sexual glands, also, the same findings were met with as described in the experimental researches described previously in the case of the roosters and the dogs.

The acute parenchymatous atrophy is evident from the absence of spermatozoa, the scarcity of contents in the seminiferous tubules, and, finally, by the presence of cellular detritus in the lumen of the seminiferous tubules.

Part V. Experimental Investigations on the Toxic Properties of the Blood of Animals

Subjected to Cerebral Excitation.

This series of experiments was complemental to other preliminary histologic researches, which proved practically negative, and designed to study the eventual changes in the other internal secretory glands in relation to atrophy of the genital organs due to cerebral excitation. In the present researches, however, I have desired to study the general and specific toxic properties of the blood serum of traumatized animals, especially in respect to the genital organs.

To determine the toxic properties of the serum of the blood of roosters and of dogs, the animals were bled during the more typical phase of severe and prolonged cerebral excitation, and the blood injected, after defibrination, into healthy animals of the same species, as in the following three experiments:

(I) All the blood serum first of one, then of two adult roosters, bled after five days of repeated cerebral excitation caused in the manner explained in the beginning of this paper, was injected, in two injections, into the peritoneal cavity of an adult rooster. The injected rooster did not show any general or specific disturbance and when killed 8 days later, the testicles were found in normal condition and in active spermatogenesis.

(II) All of the blood serum of a dog weighing 7 kg., killed 24 hours after cerebral excitation, was injected in two injections, with an interval of 24 hours, into the peritoneal cavity of another dog, weighing slightly less than the first (6.5 kg.). The injected dog did not manifest a single disturbance and when castrated 9 days after the last injection, the testicles were found in perfectly normal condition and in full spermatogenesis.

(III) The experiment was repeated with a second adult dog weighing 7.5 kg. The blood taken from three dogs weighing, respectively, 6, 9 and 10 kg., bled immediately after trauma, was defibrinated and injected intraperitoneally into the dog to be experimented on every 24-48 hours for the period of a week. The animal did not show a single general or specific disturbance and when killed 10 days after the last injection the testicles were found in perfectly normal condition and in active spermatogenesis.

The blood of animals in a state of cerebral excitation does not possess, therefore, any generic or specific toxic property for the genital organs. We shall see later on the importance of this negative result, which serves to eliminate the pathogenic conception of eventual interglandulary repellency in involution of the genital organs consecutive to cerebral excitation.

Summary and Considerations Regarding Cerebral Genetic Centers.

I desire to summarize briefly the more salient facts which have been brought out in these investigations on the functional relations between the brain and the male sexual organs.

In regard to the experimental part, traumatic cerebral excitation in the experimental animals was not followed by lesions of the brain substance, which, on the contrary, always appeared intact. The results obtained in these experiments are in accord with cerebral excitation or shock in the true sense of the word, with those disturbances, or better, with the more or less complete and the more or less prolonged transitory suspension of cerebral function following cranial trauma. As for the effects obtained by cerebral excitation on the male sexual glands in the three species of vertebrates experimented upon—fowl, guinea-pigs and dogs—their perfect agreement is astonishing not only in the nature of the phenomena, but also in their character, degree and their duration.

The histologic findings show, in fact, in roosters as well as in guinea-pigs and in dogs that traumatic cerebral excitation does not produce any appreciable functional or trophic disturbances of the testicles or adnexal organs except when the excitation is severe and of long duration. In 4 roosters and in 4 dogs in which the excitation was slight, and, above all, of brief duration, so that in a few minutes the animals were able to recover completely from the trauma, the histologic findings in the sexual organs were constantly negative, the testicles and the adnexal organs (afferent tubules, epididymis and vas deferens) being always of normal structure and in full functional activity. In the guinea-pigs the findings were also negative even after repeated excitation, but to this particular we shall return presently.

In the cases in which the cerebral excitation was severe and of long duration, in either species of animals, the testicles as well as the adnexal organs showed more or less severe functional and trophic disturbances which, from their nature and course. were very analogous to those described as due to direct lesions of the brain, particularly of the cerebral cortex (7).

In five roosters, in which the excitation was severe and repeated at brief intervals several times (8-15 times) in the period of 5-8 days, there were constant phenomena of partial or total suspension of spermatogenesis in consequence of a more or less marked acute atrophy of the organ according to the duration of the cerebral excitation. The greatest degree of atrophy was encountered 18 days after the trauma in two roosters, in which the excitation was repeated for 8 consecutive days, usually twice in 24 hours. In these the weight of the testicles decreased 2.6 and 2.0 grammes respectively, whereas the average weight of these organs in the control roosters was 28 grammes.

Microscopic examination of the testicles in these two cases showed that the seminiferous tubules were very greatly reduced in their lumen and the contents very scarce. The contents were represented almost exclusively by seminal mother cells (spermatogons) and by cells of Sertoli. The former were either in a condition purely of functional torpidity or in a state of atrophy with nuclear pyknosis; the latter were in almost normal condition, in a state of active reaction characterized by a slight grade of hypertrophy of the protoplasmic mass and of the nucleus.

The seminal daughter cells, spermatocytes and spermatids, were very scarce and the greatest part of those present were in a degenerated condition. The nuclei of some of the seminal daughter cells were reduced to a vesicle wth few chromatin elements in dissolution; in others in pyknosis, in others in *synapsis* with the chromatin substance fused into a single homogeneous mass.

Among these elements still other elements were found in mitosis usually represented by an irregular body, staining lightly, and the nuclear chromatin substance fused into a single homogeneous mass. These forms of karyokinesis were degenerate and reproduced the irregular types of the *aster* and *diaster*; it became evident that in these cases the seminal cell, because of the abnormal conditions following cerebral excitation, acquired the characters of a diseased cell, lost its primitive functional activity and attained the metaphasic or anaphasic mitotic period after being arrested in its evolution and degenerated before reaching the telophase. It therefore explains how the nuclei of these degenerated mitotic forms lose so easily the microchemical reactions of chromosomes.

The adnexal glands take part in the involution of the sexual organs; their lining epithelial cells undergo atrophy characterized by a marked reduction in the cellular bodies accompanied by a deformation and pyknosis of the nuclei.

The blood vessels of the sexual glands maintain longest their normal condition, as also the intertubular elements (interstitial cells) which, according to some authors, correspond in birds, to a so-called interstitial gland.

Two general facts merit consideration that are concomitant phenomena of the atrophy of the sexual organs in roosters, and these are (1) the behavior of the sexual instinct and the external sexual characters, and (2) the relations between the disturbances of the sexual apparatus and the general condition of the animal.

Regarding the first question, contemporaneously with the involution of the sexual organs the animal ceases to crow and quickly loses every sexual instinct; the secondary sexual characters (crest and wattle) atrophy. The cerebral excitation, therefore, in roosters evidently affects the whole sexual apparatus, arresting every function.

Regarding the second question, the phenomena of involution of the genital organs appear only four or five days after the trauma. But afterwards they proceed progressively, even when the cause is suppressed, and entirely independently either of the disturbances of a general character consecutive to the trauma, or of the general condition such as the state of nutrition, activity, etc., of the animal.

The general disturbances in roosters as a result of the experiments, aside from being usually slight, are also of short duration, so that they disappear when all or most of the process of involution of the genital organs is not only still in action, but may still be in ascension. The involution in these cases may reach its maximum degree when the animal generally has recovered its former general condition. We may, therefore, conclude from all this that the excitation possesses a special predilection on the organs of procreation which remain profoundly disturbed in all their innermost functions independently of the general condition of the animal (external appearance, activity, weight, etc.).

Aside from the value that these facts have *per se*, they merit special attention, because they agree essentially and in all their particulars with what I have described in my preceding works as the immediate effects in these animals resulting from extensive destruction of the brain or hemi-cerebration. The only difference existing between the effects of these two apparently diverse causes, lies in the course of the phenomena of involution of the sexual glands. After destruction of the cerebral matter it is more rapid and tumultuous than after simple cerebral excitation with integrity of the cortical substance.

The atrophy of the testicle in roosters, after cerebral excitation, as also in guinea-pigs and in dogs, is always transitory and of short duration. Even in cases of the severest degree the organ becomes restituted by a process of re-integration—anatomic and functional. In roosters this is completed from 35-40 days after the excitation and is followed by the re-appearance of the sexual instinct and the secondary sexual characters.

In guinea-pigs more difficulty than in roosters does the cerebral trauma produce involution of the testicles. It is only after repeated trauma provoked for 15 consecutive days that a partial arrest of spermatogenesis can be obtained which may persist for several days. The organs recuperate their normal function within 30-32 days after the trauma.

This feeble reaction of the genital organs to cerebral excitation in guinea-pigs in contrast to the roosters cannot be interpreted as a less intimate functional relationship between the brain and the genital organs in guinea-pigs than in roosters. It may rather be stated that the cerebral genetic centers in guinea-pigs are less developed than thy are in roosters, as we shall see later on.

As regards the character of the involution process of the testicles in guinea-pigs, it is not noteworthy, although it is a repetition in a minor degree of that in roosters. It is rather a question of functional torpor of the organ without any special characteristics. It is necessary to remark that even in guinea-pigs the functional disturbance of the testicles is observed sometimes several days after suspension of the trauma and, analogously as in roosters, it may proceed independently of the general condition of the animal so that it may attain its maximum grade when the guinea-pig has already recovered, partly or entirely, its former condition. Not infrequently epileptiform crises, which are liable in this animal, persist as a complication for one, two or three months.

It may, therefore, be concluded that in guinea-pigs, just as in roosters, though in a minor degree, cerebral excitation affects with predilection the genital organs, disturbing their function.

In dogs the involution of the male sexual organs after cerebral excitation takes place as was already described but with some important differences in particulars from what occurs in roosters and in guinea-pigs. As already noted, slight cerebral excitation of short duration does not give rise in dogs to appreciable functional disturbances in the genital organs. But when the trauma is severe enough to cause paralysis and loss of consciousness for 20-24 hours, then the disturbances are considerable. In dogs, however, contrary to what occurs in roosters or in guinea-pigs, one cerebral excitation may usually bring about the maximum degree of involution of the sexual organs or the adnexa. The effects may, however, vary in different subjects and appear, at times, quite contradictory.

Thus, notwithstanding cerebral excitation with severe shock, lasting for a longer period than 20 to 24 hours, in 15 dogs killed at different intervals, during the first month after the trauma (see the first five groups of experiments), the general condition had in great part been completely re-established; of these 15 dogs in 9 the results were clearly positive, whereas in the other 6 the results were negative.

In the positive cases the findings were characteristic and agreed essentially with the findings described above in the roosters and left no doubt as to their nature and pathology. That is, we may attribute the negative findings to a special resistance on the part of the individual animals, or else to premature killing of the animals, inasmuch as the process of involution in dogs proceeds slowly.

That the individual reactions of these animals can influence decidedly the effects produced by cerebral excitation is clearly demonstrated by the eight subjects comprising the second and third groups of experiments and which were killed between the seventh and the nineteenth day after the trauma, and at a time when the animals had not only passed through the period of shock but had also fully recovered from their general disturbance. Of these, the findings in three were entirely negative, but in the remaining five, killed almost contemporaneously with the former three, the findings were positive, and, moreover, so typical as to leave no doubt whatever regarding their nature or their pathologic significance.

The phenomena of involution of the male sexual glands of the dog correspond essentially in their complexity to the phenomena in the rooster. They are particularly characterized by partial or complete arrest of spermatogenesis, accompanied by more or less extensive fatty degeneration according to the duration and severity of the cerebral excitation, or according to the length of time intervening between the trauma and the death of the animal. The functional arrest or torpidity becomes especially evident by excessive rarefaction of the seminal epithelium, scarcity or absence of elements in mitosis, frequency of seminal cells, especially the seminal mother cells, in a condition of atrophy with nuclear pyknosis, the scarcity or absence of seminal daughter cells and consequently of spermatozoa and finally by the frequent presence of elements in necrobiosis.

All these characteristics, especially the necrobiotic phenomena, are typical of the first phase, of the acute phase of involution of the testicle. And in severer cases it extends to all or almost all the pre-existing seminal daughter cells.

Later, when the first symptoms of re-integration of the organs begin to appear, the necrobiotic phenomena are fewer and confined especially to the part of the seminal cell in mitosis which, by reason of the torpidity in which it finds itself, is usually arrested in the phase of the aster and of the diaster, as already described in the case of rooster.

Among the more characteristic phenomena tending to prove a severe functional disturbance of the sexual glands in the dog, the frequency of seminal cells in *synapsis* merits special consideration and, above all, the presence of atypical cells which, as I have already pointed out in a special work (6), represents a true functional anomaly of the seminal cells, a true aberrant spermatogenesis.

The exceeding frequency of cells in *synapsis* belongs properly to the first stage of the involution of the testicle, the acute stage characterized, above all, by phenomena of disintegration, of necrosis of the mobile pre-existing seminal elements. These forms are observed, occasionally also normally, as much in the mother cells as in the daughter cells; but their number in these cases is very much greater than in physiologic conditions so that they are found extensively in the seminiferous tubules. Moreover, the synaptic forms constitute an abnormality, not only because of their excessive number, but also because of the senile characters of these cells. In them the chromatin substance frequently accumulates in a peripheral point of the nucleus, losing, in these cases, their characteristic filamentous aspect and appearing as a compact homogeneous mass, staining deeply with hematoxylin. But the cellular protoplasm always appears disintegrated, pale, vacuolated, the cellular borders notched. The disintegration and the subsequent fusion of the chromatin substance always precedes, however, the involution of the cytoplasm and usually involves, contemporaneously, diffuse groups of mixed cells in a state of rest or a mitotic prophase. It demonstrates how the state of *synapsis* in one cell constitutes, *per se*, a condition of *resistentia minoris*, capable of easier degeneration, in contrast to other cellular types.

The cell in *synapsis*, therefore, because of its excessive frequency and degenerative characters, constitutes in these cases a serious abnormal condition of the sexual glands.

All that we can attribute in favor of the special form assumed by the chromatin substance, described first by Moore (1890) as a natural phenomenon preceding the coupling of chromosomes in each phase of the period of maturity, is that it is of no importance, being an artefact due either to the action of the fixing reagent or else to a condition of special fragility of the nucleus as indicated recently by Janssens (8), Van Molle (9) and Van Hoof (10).

In our case the abnormal conditions of the sexual glands, and more precisely the state of functional torpor, tends in the first instance to favor synaptic contraction of the chromatin with the aid, probably, of a special fragility of the nucleus preceding the coupling of the chromosomes; in the second instance, it tends to cause the death of the same synaptic forms with blocking of successive evolution; that is to say, impeding the coupling of the chromosomes which certainly constitutes one of the more critical phases of indirect division.

Among the facts of degenerative nature characterizing the involution and regeneration of the testicle in the dog the pseudo-giant cells are of special importance. But to return to this question presently.

In regard to the atypical elements which represent a true functional aberration of the seminal gland, I refer the reader for more extensive details on the nature and character of the findings to my special paper on aberrant spermatogenesis (6). Here, I merely wish to confine myself to a *resumé* of the principal facts and indicate their importance.

The atypical seminal elements were encountered in numbers worthy of consideration only in six cases, the animals having been killed at diverse intervals and exactly 7, 9, 15, 22, 32 and 55 days, respectively, after cerebral excitation. The findings, therefore, do not constitute a constant character of involution of the testicle in the dog resulting from cerebral excitation. The nature is in every way of such importance as to deserve special consideration.

The findings varied markedly in their proportions and in the various subjects, but they varied particularly according to the length of time that the animals lived after the cerebral trauma. From the complex of facts, we can say that in about the first ten days subsequent to the trauma, that is to say, when the animals had just recovered or were still recovering from the general disturbances, the testicles underwent the acute phase of involution, the phenomena of which were presented in limited proportions and with not always definite characters. (The first two dogs were killed on the seventh and ninth day, respectively, after the trauma.)

Later, from about the 15th to the 30th day after the experiment, when the animals were usually fully recovered from the general disturbances, and when the involution of the testicle had already reached or was about to reach its maximum intensity, the phenomena assumed more imposing and demonstrable proportions and characters, but always varying, nevertheless, in the different animals experimented upon. (The dogs were killed 15, 22 and 32 days, respectively, after the trauma.)

Towards the end of the second month of the experiments, when the sexual glands had recovered their former normal structure and function, the phenomena, while conserving their characters, were of minor grade. Finally, in the third month, when the anatomic and functional re-integration of the organ was complete, there was a disappearance of all phenomena. (Dogs killed 75 and 85 days, respectively, after trauma.)

The findings, then, may be summarized in the following way: The seminal cells in mitosis, particularly the daughter cells, usually after having reached the stage of the prophase of that of the metaphase, become arrested in their physiologic evolution and afterwards, without losing their biologic individuality, they undergo transformations devoid of processes of karyolysis; but they show all the characters of a true aberrant evolution giving rise to a process of atypical spermatogenesis which substitutes physiologic spermatogenesis.

The transformations that the seminal cells undergo are of constant nature and follow from the true evolutive phases that present typical and almost constant characters in the prophase and in the metaphase. In the one as in the other case they are profound and concern the cytoplasm as well as the idioplasm. The cytoplasm becomes torpid, stains more intensely and assumes a uniform aspect so that it quickly loses every trace of the achromatic karyokinetic figures. At the same time it undergoes swelling by which the cell increases to double in size, sometimes triple or more, being easily distinguished amongst other epithelial cells of the epithelial layers of which, in origin, it is an integral part.

The changes in the idioplasm are, however, more characteristic and more important. They take place contemporaneously with the changes in the cytoplasm and can be separated into the following principal phases: In the forms in prophase there is a marked increase in the physiologic prophasic swelling of the nucleus so that it first appears as a large vesicle. But it quickly loses its characters, becomes torpid and melts into the protoplasmic mass. In the meantime the chromosomes have attained their stage of maturity, losing their round form and increasing slightly in volume so that they appear as ovoid-angular chromatin corpuscles, showing constantly in the center or at one pole, a small, pale zone with ill-defined contours.

The chromosomes that have not attained maturity undergo almost an identical course, in which they lose quickly their typical filamentous appearance and become changed into a round or ovoid mass analogously as the mature chromosomes.

The chromosomes later abandon the previous central position of the nucleus (prophase) or of the cytoplastic mass (metaphase), and irregularly invade the latter, passing through successive and typical stages which are reproduced in every case with almost constant characters. First, they lose their ovoid-angular form and assume a clearly ovoidal form always retaining, however, the pale central zone; then they become round and, following a change of their central zone, they become paler and more delimited and when seen on the flat they appear like small discs of about 2 microns in diameter each, but when viewed in profile they have a semilunar or biscuit-shaped appearance.

In all these passages the chromosomes conserve their physiologic microchemical reactions. They stain with the so-called nuclear or basic stains and take a tint which is always the same as the solution of the substance. They also conserve their elective properties so that they are easily demonstrated with the specific triple reaction method and, above all, with my method of alum-hematoxylin and basic fuchsin (as described previously).

The chromosomes of the metaphase cells undergo the same morphologic changes and they also pass into the ovoid-angular form, then into the ovoidal and discoidal form and finally into the regularly round and typical form in dogs.

The number of these chromatin corpuscles of diverse forms is always constant, as much in the prophasic cells as in the metaphasic, and it varies only with the volume of these cells. In the larger forms arising apparently directly from the spermatocytes, the number varies from 25 to 30, but in the smaller forms arising from the spermatids the number varies from 5 to 7.

The more evoluted atypical cellular elements, *i. e.*, those chromosomes of discoid shape that have already invaded the protoplasmic mass, are found almost exclusively in the more superficial layers of the tubular epithelium. The less evoluted elements are usually found in the deeper layers, which goes to show that they maintain their biologic individuality traveling from the deeper layers through the more superficial and into the lumen of the seminiferous tubules.

All the forms of atypical seminal cells are met with in varying proportions in different subjects of the six cases recorded above, evidently representing the first stages of functional aberration, or, better, of the aberrant spermatogenesis in question. In three of these dogs that were allowed to survive longest after the cerebral excitation, and were killed 22, 32 and 55 days, respectively, after the experiment, other cellular forms were met with together with those described which, from their characters, could be considered as more evoluted, representing a true phase of maturity, than the first. At other times, on the contrary, cellular forms were found with entirely special degenerative characters, which affected the more evoluted aberrant chromosomes nearer to the phase of maturity.

The cellular forms representing the more advanced phases of aberrant evolution, consist of large round cells, almost equal in size to the preceding, composed of a granular protoplasmic mass usually vacuolated and in disintegration. In these protoplasmic masses chromosomes were disseminated which had lost, in part or in whole, their discoidal form and appeared at times oblong, at times claviform, showing in size and in form the so-called head of the nemasperm of the dog in its ultimate phase of evolution. These types of aberrant chromosomes stained with basic dyes. Their number is also constant in various forms of cells and, as in the preceding, varies from 25 to 30, or else from 5 to 7 according to the size of the cell.

The aberrant seminal cells of this type are found almost exclusively in the more superficial epithelial strata or else lying free in the lumen of the seminiferous tubules. Their protoplasm is usually in an advanced stage of disintegration so that the chromatin corpuscles, ovoidal or claviform, are easily liberated and as such are found abundantly in the tubular lumen intermingled with cellular detritus.

Not rarely, finally, in the more superficial epithelial layers and in the lumen of the tubules, large protoplasmic masses are found having well-defined contours that are evidently formed by fusion of two or more aberrant and degenerated cells. In these protoplasmic masses the chromatin corpuscles are usually in a more or less advanced state of degeneration.

* * * *

From the foregoing exposition of the genesis and the morphologic and microchemical characters of the chromatin corpuscles of the aberrant seminal cells, I believe that the conclusions will be found justifiable, which was accentuated above and which sustains my contentions in my paper on aberrant spermatogenesis (6), that *they are true anomalies of development, nemaspermic monstrosities, composed purely of the chromatin substance or head of the nemasperm, that they originate directly from the single chromosomes of spermatocytes and of spermatids of the first order, arrested in the prophase or in the metaphase of their normal karyokinetic evolution in consequence of cerebral excitation.*

It is, therefore, a question of a true process of abnormal spermatogenesis which in the dog can substitute physiologic spermatogenesis as a result of cerebral excitation; a process that becomes initiated in the first days following the trauma when the animal has recovered from the period of shock and shows signs of recovery, also, from the general disturbances, but which may continue, afterwards, independently of the general condition of the animal even for a period of from one to two months.

It is, hence, a functional anomaly which disappears completely in time and gives place, later, to a physiologic process of spermatogenesis.

This aberrant spermatogenesis is not always a regular process in all its stages; but, as is observed in animals surviving longest, it is interrupted by a degenerative process affecting the chromosomes and transforming them into minute granules possessing a marked degree of refraction.

It treats of a process, probably hyaline in nature, affecting the aberrant nemasperms, already evoluted, and precisely when they have attained the characteristic form of a chromatin disc provided with an unstaining or slightly staining central zone and well deliminated. Such a process, extending to all or part of the aberrant nemasperms of a cell, becomes constantly initiated from the central zone and is limited to it, following the constant and typical phases in every element and in every animal. The unstained central zone of the discoid chromatin elements, in these cases, assumes an unusual refractiveness capable of augmentation with the progress of the process, and finally becomes changed into a minute, round, well-defined granule in which the above outlined characters reach their maximum grade. This granule, which takes the place of the central zone, then gradually acquires the property of staining deeply either with nuclear or basic stains or with acid stains. It does not take the color of the staining solution but assumes a different and contrast color. With eosin and with acid fuchsin it stains deep orange yellow, with iron hematoxylin violet, with basic fuchsin dark red, etc., etc.

At the same time the peripheral chromatic part undergoes notable and characteristic modifications. It loses its property of staining with basic stains, it becomes diminished in length and breadth and ends by becoming reduced to first a pale and delicate zone or halo and then disappearing altogether, retaining to the end its primitive microchemical reaction. It then happens that in place of the aberrant nemasperm there remains nothing but a minute, round granule which at times divides in two, endowed with the microchemical and optic properties described above (consult my paper (6) on "Aberrant Spermatogenesis" for various phases of aberrant nemasperms in normal and degenerative conditions).

These degenerated aberrant nemasperms are found constantly in seminal cells with protoplasm more or less vacuolated and disintegrated. Not rarely the disintegration of the protoplasm is more advanced than the nemasperms are degenerated, so that they are easily liberated in the lumen of the tubule intermingled with cellular detritus and other typical forms of aberrant evoluted nemasperms, as described above.

* * * *

From the facts characterizing the phases of evolution and of involution of the process of aberrant spermatogenesis, I believe that they cannot be confused with karyokinetic deviations of the seminal cells, described by various authors, as causes of the production of giant spermatocytes and spermatids (teratocytes). These are large polynuclear seminal cells, true cellular monstrosities, that are well known today and that are found, although rarely, in the testicle even in physiologic conditions but more frequently after functional disturbances of the sexual glands as, for example, after repeated coitus and during hibernation (Regaud (11), or after lesions of the testicle (Maximow (12), or after ligation of the vas deferens (Tournade (13). These teratocytes are attributed by Maximow to the function of the primitive mononuclear cell; but according to Regaud and according to Broman (14) they originate from multipolar karyokinesis and are therefore able to reproduce complete nemasperms (*nemaspermi giganti*).

The polynuclear giant seminal cells have recently been studied by Kyrle (15) following the direct action of Roentgen rays on testicles, and by Tandler and Grosz (16), also following the direct action of Roentgen rays and also after vasectomy. These authors are far from interpreting these elements as the resultants of any functional deviation whatsoever of the seminal cells but they explain them, especially Kyrle, as the products of a fusion of cells in disintegration, as true products of degeneration, analogously to what I have held in regard to the cells found in the testicles of dogs suffering from atrophy in consequence of lesions of the cerebral cortex (see my references 1, 3 and 4).

Pseudo-giant cells arising from the fusion of several degenerated spermatids were found very frequently also in the present experiments, and always contemporaneously with aberrant cells. They occupied the more superficial epithelial layers or were lying free in the lumen of the tubules. They could be distinguished from the aberrant seminal cells by their usually homogenous aspect, almost colloidal, of the protoplasm and by the appearance and distribution of the nuclei that were more or less in a state of disintegration. These nuclei had, in fact, an hydropic appearance and were sometimes here in a condition of pyknosis, there fused into a round mass or masses of varying size and number and giving the microchemical reactions of chromosomes. In every way these degenerated elements always constituted proof of the severe functional disturbances of the sexual glands and their sexual elements on the fifth and following days after cerebral trauma. Because of their early senescence they become arrested in the state of the spermatids and undergo a process of colliquefactive degeneration.

Evidently the pseudo-giant cells of degenerative characters and the teratocytes of Regaud and Broman constitute two diverse facts which should not be confused and not any less so with the aberrant cells I have described above and characterized, at least in origin, by a deviation of the chromosomes.

This aberration in mass of the healthy chromosomes has an indisputable analogy with another form of partial deviation of the chromatin substance observed by Broman (14) in a variety of giant spermatids of the *bombinator igneus* and provided with two nuclei one very large and the other very small. The large nucleus of these spermatids may usually give rise to a giant nemasperm, but the small nucleus, which may be composed of one or two aberrant chromosomes, may at times have the property of being transformed into a head of a nemasperm.

I do not mean to say that the phenomena of functional deviation observed by me constitute a characteristic of the process of involution of the sexual glands resulting from cerebral excitation. Very probably the same thing is manifested after disturbances of spermatogenesis from other causes, but they do not offer the best conditions for the study of the phenomenon in its diverse particulars.

It is not always, however, that the seminal daughter cells become arrested in their physiologic evolution and give place to the aberrant spermatogenesis described above. Not rarely, in fact, and in very variable proportions in different animals, the chromatin substance becomes grouped into a few round, usually homogeneous masses, which always retain the microchemical reactions and the elective staining of chromosomes, while the protoplasm of the cell becomes swollen and turbid, just as in the classical aberrant forms, so that with my stain of alum-hematoxylin and basic fuchsin they stain deep red. These chromatin masses may, in some cases, show the outline of a pale central zone in a manner as recorded in the first phase of the metamorphosis that the single chromosomes undergo in the classical aberrant spermatogenesis. These chromatin masses may also, by successive disintegration of the cytoplasm and without any modifications in their form or structure, become freed and travel into the lumen of the tubules in exactly the same way as occurs in aberrant nemasperms.

Sometimes such chromatin masses lose their property of taking the elective stains of chromosomes and the microchemical reactions of the chromosomes; but they become vacuolated and stain only as when the chromatin is in a state of rest. Such phenomena, which take away from the seminal cells every character of vitality, distinctly a degenerative process affecting the evoluted aberrant nemasperms, were described by me as *chromatic degeneration.*

The manner of behaviour of the cells of Sertoli during the involution of the sexual glands in the dog is very analogous to that already described in roosters and in guinea-pigs, with the difference that the phenomena of hypertrophic reactions are more marked in the former than in the latter. In the first phases of involution of the testicle in the dog, the cells of Sertoli appear with the protoplasm more turbid, more stained and the nuclei more swollen and larger than usual. The hypertrophic reaction of these elements progresses with the involution of the seminal cells, finally attaining its maximum grade about the thirtieth day after cerebral excitation. At this time, in fact, the Sertoli cell seems to have a denser and more turbid protoplasm furnished with numerous and coarse tendrils which are thrust forward in advance, invading the lumen of the tubule. The nuclei of these cells, increased sometimes to double their normal size, appear like large vesicles characterized especially by the presence of large and coarse nucleoli staining intensely a deep red with my triple colorization method of basic fuchsin and hematoxylin.

This phenomenon of active reaction, observed also by various authors in the regeneration of the testicle, is transitory, however, and the Sertoli cell re-acquires later its normal aspect and little by little the functional and anatomic re-integration of the sexual gland takes place.

The blood vessels and the so-called interstitial cells behave during the involution of the testicle in the dog just as in the rooster and in the guinea-pig; the former always retain a nearly normal appearance, while the latter show, only in the period of maximum involution, the signs of simple atrophy with slight reduction in the volume of the cells, and torpidity of the nucleus.

The adnexal organs, *i. e.*, the afferent tubules, the epididymis and the vas deferens, take part in the involution of the testicles. In the first days after the cerebral excitation the cylindrical epithelial cells assume an hydropic appearance and their protoplasm becomes more homogeneous than usual. The nucleus undergoes chromatolysis. At a more advanced stage these cells diminish and lose their contours so that they present the appearance of one hemogeneous hyaline mass. At this time also the nuclei lose their round form and become ovoidal and elongated and appear in a state of complete pyknosis.

The involution of the lining epithelium continues with a reduction in the calibre of the respective tubules, especially of the afferent tubules. In the period of maximum atrophy, the tubules become split into irregular shapes lined by a zone of epithelium that has lost its typical festooned appearance.

The involution of the adnexal organs is also transitory and they return to their normal condition *pari passu* with the anatomic and functional re-integration of the testicle.

After what has been stated I believe that there can be no doubt as to the special influence of cerebral excitation on the genital organs. The effect of this severe functional disturbance of the brain, although purely temporary, corresponds in its character, in dogs as well as in roosters and in guinea-pigs, with the disturbances that I have already demonstrated after partial destruction of the cerebrum. It is always a question of an acute parenchymatous atrophy of the testicles, a severe functional disturbance of these organs. It is also a question of trophic and functional disturbances, independent of the general condition of the animal which, as we have seen, may be in excellent condition in every other way.

The results of the present researches tend not only to constitute a new proof of the existence of higher centers for the sexual glands, but they furnish, furthermore, a demonstration of their specific value and importance by placing in evidence the hypersensibility of these centers to dynamic disturbances. And the view is strengthened that cerebral excitation is not purely a functional disturbance of the higher centers, and that the eventual lesions that are found in these cases in the central nervous system are not secondary to the trauma and due to a repercussion, a laceration of the roots of the peripheral nerves, etc., as De-Lisi (17) has also been able to confirm utilizing the same material that served for my investigations.

The functional and trophic disturbances of the sexual glands have not a single relationship with the eventual lesions of the central nervous system and should be considered as a direct expression of the *shock* of the cortical centers in the true sense of the word. No matter how severe the functional and trophic disturbances of the sexual organs be, or how immediate to the cerebral trauma, they are transitory.

We have not as yet sufficient data, in these cases, to exclude absolutely eventual *remote* functional disturbances, analogously to what is observed in lesions of the cerebral cortex. Such an exclusion is possible hypothetically, I believe, on the basis of the rapid and complete recovery of the general condition of the animals and of the genetic organs themselves.

Astonishing is the mode of reaction of the animals to cerebral excitation. It is very clearly different from species to species, either by the intensity of the involutive phenomena or by the duration of the same.

The dog is certainly, of all the animals experimented upon, the most sensitive, showing, usually after cerebral excitation provoked but once, not only the maximum grade of atrophy of the testicle but also the maximum duration of this atrophy, the re-integration of the organs being observed 75 and 85 days after the trauma.

The rooster is much less sensitive, and the guinea-pig still less so. Only after a series of cerebral excitations (10-15) and repeated at short intervals of 12-24 hours, can a complete arrest of spermatogenesis be obtained in the former and a partial arrest in the latter. Such an arrest will persist for a few days, the organs in these animals recovering their normal function 30 or 40 days after the trauma in the severer cases.

This diversity of reaction, as already stated, cannot be interpreted as a major or minor functional autonomy of the genital organs with respect to the brain. We can deduce from these experiments that the cerebral genetic centers not only vary in importance in different species, but that they represent also a development in direct ratio with the degree of evolution of the species, at least as I believe from the results on the animals experimented upon.

With new researches on lower animals the value of this new biologic law will be better demonstrated, for the results already show that as we descend the zoologic scale the cerebral genetic centers disappear gradually; and, as we have seen, they assume their maximum development in the higher animals. The anatomic-pathological findings in the case of the boy described above, and to which we will return presently, are clearly evident in this respect. At any rate the complex and severe dynamic and trophic disturbances of the genital organs following cerebral excitation serve more to demonstrate the existence and the importance of the higher genetic centers, whatever the mechanism to explain them may be.

Another fact derived from these experiments and to which I wish to call attention because it places in evidence a special and important character of the cerebral, or more properly cortical genetic centers, is the marked sensibility of these centers to dynamic disturbances in contrast to the other motor and sensory cortical centers.

All the other cortical functions in the severer cases of cerebral excitation can also become completely re-established after a relatively brief period—a few minutes or a few hours or a few days. On the other hand, the genetic functions become entirely or almost entirely abolished for a much longer period—one, two or three months, depending upon the species of animal—before recovering from the trauma completely and returning to normal equilibrium.

Moreover, of the cortical functions, the genetic function is the more important because it governs the more complex and recondite phenomena of procreation and the perpetuation of the species. And it is the more delicate and sensitive to varying disturbing causes. It therefore acquires a greater value from the physiologic point of view, and, perforce, from the pathologic point of view as well.

In no other way, do I believe, can we explain the frequent functional disturbances of the sexual organs and particularly that state of impotence with apparently no justifiable cause that so frequently accompanies the various psychic disturbances (neurasthenia), trauma and the various mental disorders.

The recent researches of Todde (18) performed in my clinic on the testicles of 200 insane and of 30 non-insane patients who died, throws light of no small importance on this argument. The functional and trophic disturbances that Todde has found with surprising frequency in the testicles of insane patients in contrast to those of individuals dying from some general disease, the nature and almost constant characters of the changes and in the various clinical forms (idiocy, dementia praecox, progressive paralysis, etc.), are striking; they are always characterized by partial or total arrest of spermatogenesis or early involution of the testicles. From our knowledge of pathology we can interpret it no differently than as a secondary phenomenon to the mental disorders from one single and common cause. Such a cause, as we will see later, can only be searched for in the functional and anatomic lesions of the cortical genetic centers.

The results obtained with the Abderhalden sero-reaction applied in psychiatry demonstrates the frequency with which the sexual glands are compromised in mental affections, and confirm, in my opinion, the great influence that the brain exercises over the function and trophism of these organs.

Finally, the disintegrative ferments of these glands found by Willige (19), Kafka (20), Hussels (21), Mayer (22), Bundschuh and Roemer (23), Nonne (24), Fischer (25), Beyer (26), Theobald (27), and Maass (28), in various mental diseases, particularly in dementia praecox and progressive paralysis, place the diverse morbid conditions in direct accord with the indivdual etiologic factors. But it is logical to suppose that these ferments depend upon a single factor, viz., mental disturbance which may be considered the result of anatomic and functional lesions of the brain.

Wishing to confine my considerations of the human pathology to cerebral excitation I cannot help, as a corollary to the experimental researches, but call special attention to the anatomic-pathologic findings in the clinical case referred to above, of the boy who died 22 days after traumatic cerebral excitation. In this case the testicles showed acute atrophy of the highest grade, characterized, above all, by a marked reduction in the contents of the seminiferous tubules, complete arrest of spermatogenesis, total absence of spermatozoa and cells in mitosis, and, finally, the presence of numerous seminal daughter cells in an advanced condition of disintegration accumulated in the lumen of the seminiferous tubules, the afferent tubules of the epididymis and the vas deferens. Such anatomic-pathologic findings correspond, *in toto,* with those observed in the experimental investigations and more especially with the findings in the dogs killed several days after the cerebral excitation. In them either the normal or the atypical cells in mitosis were absent, which in the experimental dogs constitutes the first tentative proof of the regeneration of the organ at the end of the first days after the trauma. The divergence in the findings loses every importance if we consider the diversity of the conditions in which the animals experimented upon were killed and those that caused the death of the boy. In the experimental cases the cerebral excitation constituted an entirely transitory functional disturbance and the animals, at the time of killing, had already recovered, entirely or partly, from the general disturbances of the trauma. But in the clinical case in question the grave symptoms of the trauma persisted until the death of the individual. In this case the absence of any sign of regeneration of the organ, even of an atypical process, justifies so much more the view of the severity and persistence of the deleterious cause.

The acute parenchymatous atrophy of the testicles, though far from constituting in man a specific fact of cerebral excitation, is certainly in relation with no other cause, concerning as it does a robust boy in excellent healthy condition, and in the full vigor of his sexual potentiality.

Regarding the resistance of these organs in the more severe acute and chronic intoxications of various nature, as I have shown experimentally with absinthe (5) and Todde (29) with alcohol, and the resistance of these organs in man in various toxic and acute and chronic recurrent diseases as demonstrated especially by Kyrle (30), Cordes (31), Bartholet (32) and Todde (18), the acute atrophy of the testicles in these cases cannot be said to assume an especial importance or significance in respect to its pathogenesis.

A typical example of the resistance of these organs in disease is that which served me as a control—the patient who died in the third week of bronchopneumonia. His testicles remained of a nearly normal structure and in vigorous spermatogenesis.

* * * *

It remains to refer to the mechanism by means of which the involution of the sexual organs is accomplished, or rather, how the cortical genetic centers influence the involution of the above-mentioned organs.

The results of my experiments, performed for the purpose of studying this mechanism, demonstrate that the blood of the experimental animals, even during the stage of maximum cerebral excitation, possesses no toxic, generic or specific properties that can reproduce either the general disturbances or the specific disturbances of the organs. In fact, an animal can tolerate with impunity the blood-serum of two or even three other animals in a state of shock, and this excludes the presence, at least, of severe changes in compensation which could eventually affect the various internal organs.

If, at least during the involutive period corresponding to the maximum grade of atrophy of the genital organs in the cases described above, an internal secretion were concerned which should be incriminated in severe and specific alterations of compensation, the internal secretory glands would eventually show symptoms from the effects of the cerebral trauma; but they were always normal in volume and structure.

I therefore believe that in our cases it is possible to exclude every chance of relationship of cause and effect between the grave atrophy of the genital organs and primary alterations of the internal secretory glands.

While, however, no experimental lesion was noted in the internal secretory glands, it must be understood that their total extirpation seems capable of exercising on the genital organs a specific and deleterious action, and producing, at least in adult animals such as served for the present experiments, atrophic processes analogous to those observed after cerebral excitation.

I shall confine myself to a reference of the results obtained by various experimenters after partial or total extirpation of the *hypophysis cerebri* and the *epiphysis cerebri*, the functions of which are more directly and prevalently compromised in traumatic cerebral excitation.

In regard to the hypophysis, as is well known, its great influence has been shown on the development of the genital organs and it has been proved, also, that its trophic influence on these organs is very limited in adult animals.

Friedmann and Maass (33), Fichera (34), and Paulesco (35), have not observed a single trophic disturbance in the genital organs of their animals (fowl, guinea-pigs), subjected to either total or partial extirpation of the pituitary gland.

Cushing (36) first and then Biedl (37) have observed a high grade of atrophy of the genitals in animals after partial extirpation of the hypophysis (anterior lobe); but the results of these authors were recently contradicted by Aschner (38), who demonstrated that the severe atrophy of the genitals occurred only in young animals;

but in adults is was not due to lesions of hypophysis but to lesions of the base of the brain circumscribed by this gland.

In regard to the epiphysis or the pineal gland, we have not yet experimental data to prove its trophic action on the genital organs of adult animals, and the observations made on young animals are very discordant and inconclusive.

Exner and Boese (39), after extirpation of the pineal gland in young rabbits, did not notice any effect whatever on the genital organs. But Sarteschi (40) did notice, in the same species of animal, an arrest in the development of the internal organs accompanied by marked emaciation. Foa (41), after extirpation of this gland in very young chickens, obtained an early and exaggerated development of the testicles and of the secondary sexual characters. This result has also recently been confirmed by Sarteschi (42) in puppies, in which animals he also observed an exaggerated development of the testicles.

An alteration of compensation causing severe functional and trophic disturbances of the genital organs in cerebral excitation may remain an inexplicable enigma in our case because of its specific and exclusive action.

It is therefore to be admitted that the atrophy of the genital organs in cerebral excitation may be directly due to functional disturbances of the cerebral genetic centers which exercise a functional and inhibiting action at the same time, as has already appeared from my preceding researches.

Presuming it as demonstrated that functional disturbances of the cortical genetic centers can suffice, *per se*, to produce directly functional and trophic changes in the genital organs, it remains to be determined how the relationships between these organs and their respective inhibitory centers become established and disseminated in the whole of the cerebral cortex.

As difficult as it is to enter upon such an obscure and complex question, I believe that it may be admitted for the present that the relations between the genital organs and their cortical centers cannot become effected but by means of the *sympathetic* and *autonomic* nervous system, by means, that is to say, of the so-called vegetative nervous system.

We know very little, however, of the course of these vegetative central routes destined for the various visceral functions. We only know that the greatest part of them reach finally the fourth ventricle; but as to their course further on towards the brain we possess but a few uncertain facts from which to draw concrete deductions.

As regards that which concerns the genetic centers our knowledge is confined to a few points furnished by Aschner (43), in a recent communication to the Medical Association of Vienna, on the physiology of the mid-brain.

This author, who very probably overlooked my previous investigations on the cerebral genetic functions published at diverse periods since 1907, found that after lesions of the optic thalamus in adult dogs there resulted constantly a severe atrophy of the sexual organs but that this is always very slight when the pituitary gland is extirpated. He concludes that the trophic centers of these organs are present in the mid-brain where they are in relation with the vegetative central paths.

But since I have demonstrated the presence of genetic centers in the end-brain, the optic thalamus can only be considered as the seat of other inferior genetic centers or else as a simple point of relay of the sympathetic and autonomic paths that go from the cortex to the genetic centers in the medulla.

Whatever may be the course of these paths, as the involution of the genitals is, besides being proportionate to the cerebral lesion, contemporaneous in each organ and proceeds independently of the nature of the cortical zone affected, and also of only one of the two hemispheres (see my papers cited), we can admit, in the first instance, the existence of a system of association paths, both endo- and inter-hemispherical, which can permit a synchronous and complex function of the genetic centers disseminated through the cortex. In the second instance we can admit the existence of a system of projection paths which serve to unite the cortex of both hemispheres with the inferior genetic centers, *i. e.*, with the centers in the inferior segment of the spinal medulla.

By means of these vegetative paths, and only by these and in no other way, I believe, that the severe disturbances, after cerebral excitation, to the complex functions presiding over the generation and perpetuation of the species may be explained.

Conclusions.

From what has been stated regarding the findings in the present experimental and anatomic-pathologic investigations the following conclusions may be drawn as to the effects of cerebral excitation on the male genital organs:

(1) Traumatic cerebral excitation (traumatic cerebral shock) which causes transitory functional disturbance of the cerebrum and more properly of the cerebral genetic centers, can produce severe functional and trophic involutive changes in the male sexual glands, independently of the integrity of the nervous substance.

Such changes are followed by absence of the sexual instinct and of the secondary sexual characters, and are entirely independent of the general condition of the animal.

The severity of the changes is in direct proportion to the cerebral excitation; it varies, however, in different subjects and still more, from species to species and is in direct relation with the degree of evolution of the same species.

(2) The involution of the sexual glands is characterized in its first stages by an excessive increase in the seminal cells in *synapsis*, by diminution or absence of cells in mitosis, with a relatively partial or total arrest of spermatogenesis, and finally, by a rapid and diffuse process of necrobiosis of the pre-existing epithelial cells.

Later, in the atrophied gland of the dog, new phenomena of degeneration occur always associated with functional deviation of the seminal cells which represent attempts at an abortive regeneration of the organ. The new phenomena consist, above all, of the presence of pseudo-giant cells formed by the fusion of several seminal elements (spermatids) affected by a process of colliquefactive degeneration.

(3) The phenomena of functional deviation are represented by a true process of *aberrant spermatogenesis* which substantiates the physiologic and which may be summed up as follows: The seminal cells, being arrested in the period of the *phophase* and of the *metaphase* of their mitotic evolution, after successive and typical changes of their *cytoplasm* and *idioplasm*, but always retaining their primitive biologic individuality, give place to the formation of nemasperm monstrosities (aberrant nemasperms), constituted exclusively of chromatin substance.

These aberrant nemasperms originate from the direct transformation of single chromosomes which, after typical evolutions, may assume the characteristic form of the head of the nemasperm.

The aberrant nemasperms are always arrested, however, in their evolution by a characteristic degenerative process, probably hyalin, becoming changed into minute granules endowed with a special power of refraction. In these cases, also, the cytoplasm is in a state of disintegration, and two or more cells may become fused into a single mass. At other times the aberrant spermatogenesis is arrested at its initiation by an abnormal and special fusion of the chromatin substance (chromatic degeneration).

During these phases, especially in the dog and in man, there is a hypertrophic reaction of the cells of Sertoli accompanied by simple atrophy of the afferent tubules, the epididymis and the tubuli deferentes. The blood vessels and the so-called interstitial cells or gland remain unchanged longest, and only in the most severe cases do they show trophic disturbances characterized by simple atrophy.

(4) The involution of the genital organs is, in general, a transitory affair, its duration being in direct proportion to the degree of cerebral excitation besides the

degree of evolution of the animal itself. It is followed by a true anatomic and functional restitution of the organs.

(5) The restitution proceeds more rapidly in roosters and in guinea-pigs than in dogs and is accompanied by a return of the sexual instinct and reappearance of the secondary sexual characters.

(6) The blood of animals in a state of cerebral excitation does not acquire any general or specific toxic property. There is no important data in favor of an eventual equilibrium in the phenomena of functional correlation between the internal secretory glands and the involution of the sexual glands.

From these conclusions we can therefore draw the following corollaries:

(a) The involutive phenomena occurring in the sexual glands after cerebral excitation are directly dependent upon the functional disturbances of the superior genetic centers which repercuss on the inferior centers through the cortico-spinal vegetative paths.

(b) Of the cerebral centers, the genetic are the most sensitive to functional perturbations and their importance and development are in direct relation with the grade of evolution of the species and more properly with the degree of evolution of the brain.

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THE LARGER PROBLEM INVOLVED IN THE ETIOLOGY AND PATHOLOGY OF NERVOUS AND MENTAL DISEASES.

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THE problem involved in the etiology and pathology of mental and nervous diseases warrants one in trying to understand and somewhat to define the nature and action of consciousness as expressed in normal physical life. All that we can understand of consciousness in normal every-day life is that which is intimately related with the functions of the brain and nervous system. That expression which fits in with normal harmonious daily activities with the masses, which allows the majority a peaceful and working adjustment, must be assumed as the norm for the individual. The reason for some standard as the norm is obvious.

Structural and cell changes in the brain and nervous system, either one or the other or both, produce a modified expression through the body, which in many instances can be definitely traced to its source. We face the fact, however, that in many cases there is no cell or structural change to be found to explain the modification from the norm. In these cases the condition found is similar to those whose causes can be definitely traced to lesions in the brain or nervous system, or both. It would seem, then, that we must search deeper and wider than mere cell and structural changes to find the cause, and follow faithfully any clue which may give light toward the understanding of the nature of such abnormalities.

Physical Science has been given its clue and is presented with the opportunity to search in its field and to pursue the electron, in its flight to further knowledge. Psychology, however, seems lashed to the mast by apparent unwillingness to look about and search with patience and tolerance to identify consciousness as separate from the physical organism. Phenomena pointing toward this separate consciousness are as thick as autumnal leaves, especially to those whose minds are versed in the study of mental reactions. Psychic researchers have gathered facts in abundance in support of this theory, and to my mind have demonstrated conclusively the truth that consciousness survives the death of the physical body; that it survives as an individual entity, retaining its memories, with the power to initiate, organize and select its own transcendental activities. (To those who cannot accept this, I would urge a review of the literature on the subject, making sure that the literature reviewed bears the stamp of scientific scrutiny. To those who will not trust the literature, I would say investigate for yourselves.)

If consciousness survives the human body and can become a thing apart, one must postulate the theory that a part of the causes may be found in the thing itself as separate from the physical body, and this we speak of as the ego. This theory demands a thorough search of the ego itself for causes of abnormalities, if ways and means can be devised to make such a search. Herein may be found some of the causes which may aid us in understanding the nature of a residuum of the abnormal activity in mental and nervous diseases.

Consciousness, then, is to be classified as the expression of brain and nervous activity, plus its stimulating instigator, the ego. Those causes which are intro-organic, which are known, and which are inferred, I will pass by while trying to outline the problem confronting us. All who are interested are alive and alert to this angle of the problem as well as to the method of procedure involved. That somatic disturbances modify normal expression and produce abnormal activity, no one can deny—the proof is conclusive. That I may not seem one-sided, I will here state that I am aware that a very large percentage of the abnormal conditions can be traced to defects in the physical instrument, and I feel that light gained in the future will reveal the same foundation for many more cases. Yet the field in which I am endeavoring to outline the procedure of labor will, I am sure, give light upon the very obscure conditions now confronting us.

There is a residuum of unfortunates whose bodies do not show those somatic disturbances primarily, nor can there be traced any organic derangement to explain the abnormal condition. They do show, however, the fact that deep within their thinking selves is, and was, the starting point of their difficulties. Acting according to the impulse which prompts us all in our search for new things, light has been thrown upon the difficulties surrounding the ego when such cases have been submitted to the experimentation of the psychic researcher. When such is the procedure it is often found that the ego, the stimulating instigator itself, is at fault; and the fault is through disturbances surrounding the ego in a transcendental existence, which are causes external and separate from the physical organism. The method of the psychic researcher I will attempt to outline later.

If the brain of an incarnate normal individual can be, on special occasions, influenced in thought expression by a discarnate entity, with power enough to reflect to us through that thought expression memories of the entity's physical life and experiences—these memories selective, numerous and organized enough to be beyond chance coincidence, outside the knowledge of those interested, having no relationship to those experimenting, other than proof of identity, and constructive and benevolent toward our enlightenment—does it seem improbable, or impossible, that through similar means malevolent activity may be directing the stimulating instigator, or be the stimulating instigator more or less directly? If the activity be malevolent or innocent, or both, would there not be an expression through the brain and nervous system which would produce abnormal physical and mental activity?

This is just what has been found as a part of the causes of those cases which have been submitted to the experimentation hereinbefore spoken of. Revolutionizing as this may seem, and startling as it is in its conception, a portion of the causes of these abnormal conditions has been proven to have been the action of entities who once had their being in a physical environment; who now inhabit a transcendental world, retaining their memories and desires, and not loath to gratify the same through any physical organism that can be influenced in this way. The power to think, select and act according to the instincts of their nature is retained. If the entity is ignorant, the effect is the same; and when a weak, vacillating mortal is caught in such meshes and gives way to transcendental stimulating impulses, confusion reigns and abnormal mental and physical activity is the result. It is not difficult to conceive this as possible when we have witnessed with our own eyes the hypnotist's effect upon a weaker brother. Here the percipient's thoughts completely control the recipient's organism. That these things are true has been so stated through various channels long ago; but the facts were so incomplete and disorganized that they did not present an organic whole, and were so unscientifically set forth that they received but little consideration from thinking, progressive minds, and rightly so. But latterly the approach has been upon a different basis. The experiments have been carried out patiently and earnestly by those whose training grants them scientific qualification. The results have been to open a new vista through which new hope, new light, will come for those who are so unhappily afflicted. Indeed, it opens a new vista for all mankind, through which will be pointed the way to gain strength and power, both physically and mentally. The proof of discarnate entities controlling completely, on the one hand, and to varying degrees, on the other, mortal's thought expression, has been proven through these experiments. (At this point let me state that if light is to be gained, it takes time, money, and no end of patience. The labor involved is great. Much training is needed to acquaint one's self with the method of procedure. Often the offending cause is very elusive, and voluminous notes must be kept and studied before one is aware of what is being attempted.)

The physical body is the instrument through which the mortal ego expresses itself in a physical environment. The brain and nervous system are that part of the instrument which makes that expression intelligent and progressive. It is that part which also makes it possible for a discarnate entity, whose habitat is in a transcendental world, to express itself in a physical environment. In normal intelligent, progressive expression in a physical environment the incarnate entity is the sole tenant of the physical instrument; he is expected to maintain that tenantship inviolate throughout the tenure of his physical existence if normal, well-balanced activity is to be maintained. The will, when strong and well balanced, is the threshold over which none may pass. The will is made strong, and kept strong, by the willingness of the individual to do his duty to mankind and to himself; and by having a knowledge how best to perform that duty. Any disobedience of law, whether physical or moral, weakens the individual will and makes possible the invasions of elements which disturb the normal balance. When the will is weakened from one cause or another, and an altogether new mental activity is started, with its accompaniment of confusion and loss of poise, there is bound to be invasion of elements, such as heretofore stated. Bodily strength is depleted, and there is not enough energy to combat the mental vagaries. If the condition continues long enough it is not difficult to isolate and be cognizant of the external stimulating elements which so often initiate vagarious activities, both mental and physical. Most often the starting point is in the consciousness of the individual himself. Worry, disappointment, defeat of cherished hopes, which are repressed and struggled against, may be the abrasion within the consciousness which is the gateway for the poison to enter. The repression saps the energy rapidly, making the individual an easy prey to outside elements which have been invited by the individual himself. It is the test which we all must endure. Those things which one must meet in every-day life are the test of the strength of will to maintain an even balance in the face of great trial. If not met, all are in danger from the same menace to which those unfortunates are a prey.

Bodily organic disease may be the starting point, causing an apprehension which becomes an obsession in the end, to invite its mental invasion. That which at first was simple to combat now becomes a very difficult problem to meet. How many physicians have been confronted with this same thing! A simple minor ailment, overcast later with symptoms out of all relationship with the simple defect. Long after the physical defect has gone the symptoms increase or remain. Hysteria, I hear! How easy! But it does not explain anything; it is simply a name for a group of symptoms which require explanation. If you look transcendentalward perhaps you may uncover the cause of the hysteria and the persistence of the symptoms. Stimuli may travel in both directions from incarnate to discarnate, and from discarnate to incarnate.

At this point I will try to outline the method of experimenting in ascertaining these causes. The data for truth which has been adopted by psychic researchers is through cross-reference obtained through two or more automatists. An automatist is one whose mind and nervous system can, on special occasions, be impressed or controlled by discarnate agents. The automatist may or may not be entranced. Usually, however, he, or she, is entranced for the reason that by this method it seems easier to get through purer thoughts.

When a patient is had for experiment he is taken into the immediate environment of the automatist, who has no previous knowledge of the patient's existence or of his condition. Indeed, in most of the experiments the automatist was not aware of the patient's being near him, for the reason that the automatist was entranced before the patient was brought in the environment, and the patient left before the trance was terminated. The reason that the patient is brought into the immediate environment of the automatist is that the rapport may be established more easily and completely. Experience has taught us that. This may have to be done many times, if at first things are slow in developing. Yet, at other times, it need only be done a few times. Absolute quiet is demanded from patient and those directing the experiment. The automatist is to be given a free hand for freedom of expression, unhampered by foreign distracting stimuli. When in an entranced condition, or in rapport with transcendental forces, an automatist's faculties are intensified a hundred-fold; his sensibility to sound is increased, and all his emotional propensities stimulated in proportion. Thus it is, if you wish to get good results, you must quietly receive what is forthcoming and be thankful for it. There must be no intrusion by the experimenters, for this often breaks into what may be a pertinent line of expression leading to some desired and interesting information. Once a mishap of that kind occurs, rarely does one get good results from that individual experiment. Neither must you conceive that pertinent expression will be poured forth in volume, giving facts and data related to the matter in hand, similar to the reproduction of the talking-machine. This is not so easily accomplished, and your patience is tried to the utmost by the irrelevant matter which becomes so voluminous at times. When, after a few experiments unproductive of results, your patience has about reached its limit, seek a change, with plenty of diversion accompanied by a few nights of good sleep, and approach again the mass of chaff, and after studying you are interested by the light thrown on the nature of the process involved. You are acquainted with the fact that the automatist's mind has colored the expression greatly, yet here and there are little relevant hints which set you thinking. In a word, it is subliminal content, with outside stimulus. It is much like looking at the landscape through colored glass. The purest of expression must of necessity take on the coloring of the media through which it comes, the very nature of the process involved demands this. None who are not endowed with patience, with a deep desire for truth for truth's sake, and with tolerance, need attempt this work. The mental attitude of those experimenting affects the results. An antagonistic frame of mind, or a strong doubting tendency, powerfully affects the automatist, inhibiting the mental processes and preventing pureness of expression from the sources from which it is sent.

All things being arranged, and your patient having been in the environment a sufficient length and number of times, it is quite likely that some reference will be made to the patient in some way through the expression of the automatist. If the results are to be valuable as data to serve as cross-references, accurate records must be taken and kept; physical movements of the automatist must be a matter of record, for even that may serve as a cross-reference to something which may come later, or which has gone before, and prove to be valuable as evidence of identity. The manner of expression of the automatist may be in writing, talking, or through physical movement, or all three expressions may be used in the one experiment. It is the writing, however, which serves the greatest purpose and is mostly used. It of itself becomes a matter of record. Very important is the fact that the character of the automatist must be assured; that the motive must be high, with the ideal well grounded, accompanied by a willingness to make the sacrifice for so noble a work. Indeed, it is a sacrifice, for it involves much which in the ordinary walks of life is not permissible.

The environment of the automatist must be kept quiet, pure and clean. The stress and worry, and the wear and tear, in the struggle for existence, are things which should be seen to in protection of the one who allows his organism to be used in this way. It is the duty of those who are interested to see that this protection is given. Ways and means should be devised whereby the automatist's wants and needs are fulfilled. Very often after an experiment has proven of worth and netted good results, the automatist's environment is harassed by the continuance of the insidious attempts to invade the mental processes for destructive purposes. If this were accomplished, confusion would be the result. If the struggle for existence were keen and the environment inharmonious, this very thing would be likely to happen. Stress and strain invite and lend strength to their transcendental co-partners; while peace and quiet give power toward harmony and progress. Hence the very great importance of protecting the automatists. They are your laboratory equipment, or at least an important part of it, and must be kept in perfect working order. Experience has taught us the great importance of this, hence the stress laid upon its necessity.

Another important factor is the physical health of the instrument, for great amounts of energy are used in these experiments, which are withdrawn from the instrument's organism; how important it is then that the amount in reserve be kept to its greatest capacity. There is a danger, too, in experimenting too often, and too long. One experiment a day, or one in two days, is often enough; better results will thus be obtained. The locality is important; a place where quiet reigns is very much to be desired. The crowded, noisy metropolitan district is not the desirable place in which to establish such a laboratory. Patients and instruments must not be kept in the same environment. These facts have all been acquired after bitter experiences.

Things in readiness and your experiments started, one would be expectant as to the nature of the phenomena which is to serve as light toward the understanding of the etiology and pathology of these conditions under discussion. It is a natural inquiry, and I will strive to outline the possibilities, which will serve as a hint only as to what may occur. (At this point I will refer anyone who would like to study the detailed records of a set of such experiments, involving cross-references and pertinent facts as to the etiology and psycho-pathology, to the Proceedings of the Society of Psychic Research, Vols. 9, 10, 11, Doris Fischer Case.)

In these experiments it takes time for the forces to get adjusted to the work in hand. Then there may be difficulty at first in getting in rapport with the instrument, the length of time involved depending upon many conditions, which experience alone can determine. Thus I urge all to be patient and not to give up. If patience and persistence are shown, all things being in accord toward a common end, success will crown the effort. The first relevant expression is usually the attempt of some relative, or one vitally interested in the patient, to reveal his identity. The facts must meet the requirements of cross-references and be strongly enough organized to be pertinent in the earthly memories of said entity. Telepathy is an objection which must be met by these facts, but as a serious barrier to the truth of the source of them, to my mind, is not valid. The reason for this statement cannot be discussed. Space will not permit of it. (Again do I refer to the literature on the subject.) Pertinent remarks may be made about the patient's condition, or the instrument may complain of localized pain and suffering in the region of the organism similar to the patient's area of suffering. Head symptoms are spoken of in characteristic manner. Phobias are apparent in the trance utterances. Dread of some impending disaster will be uttered, yet it will be clearly manifest in the expression that such fear and apprehension is foolish. "I don't know why I am frightened; there seems no real cause, yet I am overwhelmed with fear." Following, often has come a struggle in the organism of the instrument, representing a death-scene of someone who later reveals his identity, which will correspond intimately in character to the actual transpirance of such a scene in the life of said entity while incarnated. Once in a while the truth of this can be checked up in the memories of mortals who are acquainted with the facts. Witnessing such an occurrence through the body of an instrument is indeed dramatic, and if one were not familiar with the possibilities and were not prepared for such occurrences, it would seem that the instrument itself were about to make the transition. Breathing ceases, the heart becomes at times imperceptible, the color fades, and dissolution seems imminent. On one such occasion, in the midst of this occurrence, and when I was very much alarmed at the picture presented, the instrument's voice resounded in firm, loud acclaim, "Have no fear; we are watchful and on guard." It was enough to arouse me to the possibilities involved, and my interest overcame the fear. Soon after, the instrument came to normal consciousness and said: "I dreamt I was shot and was dying. My! but it was real! Yet it did not seem to be myself, and again it was myself." How strange!

Again may come some remarks about the cause of the patient's condition, the cause of the onset, such as shock, worry, a love affair, an accident, injury, etc. Yet again, facts which the patient is trying to conceal will be given, masturbation, illicit relations, or, fostered hopes, which serve as the canker in the mind. In one instance, I was in this way acquainted with the fact that a patient was the father of an illegitimate child. This he had kept from me for two years after I had urged him to state frankly all things hidden. The name of the person was revealed and the place of residence. These he acknowledged to be true, but was much upset and very much puzzled to know how I became acquainted with the facts, as the relationship existed on the other side of the water, in Wales. The uncovering of the truth and confronting him with it seemed to do something to his consciousness, for at about that time he commenced to gain mastery over himself, which finally grew to complete control. During the period of his illness he constantly saw an apparition of a woman, which did not correspond to his paramour. From the description, the same apparition was seen by the automatist and described. This also disappeared, and the man regained his health and was able to work daily in a normal way.

There are times when the expression becomes vicious and leering, in fact, perfectly demoniacal, threatening dire vengeance upon all of us, the instrument especially. The fists are raised to strike, and I have been the victim of what seemed to represent an attempt to shoot, or the hand has been uplifted and plunged forward viciously as though attempting a knife thrust. The corresponding utterance would be forthcoming with leering and gloating as though the deed actually had been accomplished. There is a dramatic play of personality involved in these experiments, so unique and wide in its scope that one would have to become a finished actor or actress even to approach this ability, and yet these scenes are carried on day by day with the same facility. If you are familiar with your patient's thoughts and have a working knowledge of his hopes and desires, you will find much in the expression of the instrument to check up with your patient's mental horizon.

When this goes on long enough there seems to be another group in control working patiently and intelligently toward the enlightenment of both the discarnate in duress and ourselves in ignorance of such matters. Through means of which we are not aware, these same forces seem to be able to exorcise the obstructing elements into a confession of their guilt, if it be such, or to enlighten their ignorance, if it be ignorance, and further to gain a willingness and to assist these same elements in revealing their identity and in stating their position and the cause of their confusion. Sometimes the facts given can be identified as their earthly experiences and add to the proof of personal identity.

In another experiment, after the body had gone through convulsive movements and struggled until strength seemed exhausted and dissolution imminent, weak heart action, breathing typical of such danger, color faded to a deathly pallor, the right hand suddenly reached for the pencil and was slowly raised, with an entire change in the personality of the automatist. Color came back, breathing regular, heart assumed its normal action. The hand then slowly, evenly, started to write; the context was this: "Be not dismayed, brother. Be patient with the entity. He arrived here in an unconscious state, and came to consciousness in our environment. He knows not of the transition. Confused and distressed, blind and ignorant, he must be awakened to his spiritual existence. This opportunity was given him to go through his death struggle again through a physical organism conscious. It has aroused him to a degree and slowly will he realize his true position. Blessed are they who unselfishly lend their efforts to the uplift of a soul. Peace be with you.—Faithfully, Imperator."

The phenomena have repeated themselves many times and through different instruments. The implication is far-reaching.

This is just a bare outline of what is possible. It is very meagre, I am aware, but points towards facts which bear mighty implications, not alone in this field, but to the whole scope of human endeavor.

In laying these facts before my medical brethren, I do so because I believe here is a realm filled with very pertinent, interesting and important truths, and it is also my earnest hope and desire that more, many more, will be stimulated to look into these matters. Although the methods of procedure are unusual and perhaps distasteful, is it not our duty to lay aside prejudice and free ourselves from *a priori* conceptions and approach with a wide-open mind anything which bids fair to add to our knowledge of the healing art and at the same time to be in a position to receive the full measure of benefit that such a blessing could afford? It is our duty to study more deeply and in that study to use any means which may throw light upon those symbolic processes which issue from consciousness. Freudian disciples are striving to give some explanation to these very things, and some light has been gained there, yet I feel a co-operation with this angle of the work would reveal some very pertinent stimuli behind many of these same issuings. There are many cults into whose midst drifts many a patient after running the gamut of all sorts of specialists. In many instances they receive benefit simply because of the fact that they are given a new outlook upon life and are taught the principles of their own innate power. I believe it is the duty of the medical profession to make some organized effort to study, understand, and make use of the nature of such influence. It is understandable, I believe, and with the knowledge of anatomy, physiology, chemistry, and materia medica fortifying it, great benefit, and much progress for all, would be the outcome.

'Tis but a day
We have to stay,
    To wander thru the maze.
How sure the way,
If light will play,
    To show another phase.

We see them sigh,
We hear them cry;
    They know not what to do.
Blest be the day,
When new-found way
    Sends power to help them thru.

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LATENT PSYCHIC CAUSES OF NERVOUS DISORDERS.

By

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DEDUCT from the total number of cases observed by anyone interested in nervous and mental disorders those of organic, toxic or exhaustive origin and there remains a formidable percentage of neurotic derelicts whose trouble is purely psychic. The management of this psycho-neurotic residue is a difficult problem: let us see what may be done towards its solution.

Nervous disturbances due to conscious worry need not claim our attention here. Their cause and cure is manifest to all. The merchant whose nervousness is caused by deficit in his business, needs business counsel and capital—not a doctor. Worry enters into our problem only when it has become buried alive, so to speak.

Leibnitz was first to announce that we have more psychic equipment than we are aware of, that part of the mind is conscious and part not conscious. Since this philosopher's day, much study has been given to the non-conscious part of the psyche. French psychologists investigated it through hypnotism and more recently the Viennese school of psycho-analysts has essayed to explore the extra-conscious realm by way of the dream.

Purposely the terms "subconscious" and "unconscious" are avoided as objectionable in this discussion. Subconscious symbolizes a special relationship which has no place in our concept of the mental makeup; and unconscious carries with it a sense of negation and passivity not warranted by the affirmative and active nature of the latent conscious mind. As possible substitutes for unconscious, the writer has considered such terms as "extra-conscious," "para-conscious," "non-conscious," "abconscious," and even "contra-conscious." But aside from the hybrid nature of some of these words they are all objectionable on other grounds. "Latent consciousness" expresses best our conception of that part of the mental processes of which we are not ordinarily aware.

The entire mind, or psyche, may be said to consist of three coalescent elements, namely:

Consciousness.
Fore-consciousness.
Latent-consciousness.

Consciousness is psychic energy engaged in adjusting the individual to his environment. Simple reflex acts, such as flow of saliva in response to the presence of food in the mouth, are not conscious because the energy involved is slight and leisurely expended, in comparison with that of higher adjustments. Then, too, these simple acts work automatically and always in the same way. Conscious adjustments, as when a person gets out of the way of a rapidly approaching automobile, are reflex acts too, but of vastly higher and more complex order. The psychic energy involved is much greater in amount and in intensity than was concerned in the gland reflex—enough greater and intenser to be "felt," realized. The difference between the conscious and non-conscious reflex is comparable to the difference between a machine running slowly and giving out no appreciable sound or heat and the same machine speeded up to a velocity which hums audibly and radiates heat and even light itself. Our aware-ness in conscious activity is proportionate to the degree of consciousness, which varies from a lowest degree at which it merges into latent-consciousness up to a high degree at which one is acutely aware of himself. Also, there is no sharply defined boundary between the conscious and the latent-conscious; the one merges into the other, as, for example, when we are half-awake.

On the frontier of consciousness, so to speak, is the fore-conscious. This realm of the mind is the reserve consciousness in which are stored the memories which are useful to consciousness from time to time, but which are not constantly in consciousness. In the fore-conscious are held, subject to demand, all the statistical impressions which constitute the sum total of one's available information and education. In certain neurotic states, hysteria, for example, the fore-conscious becomes drawn into the latent-conscious, or overcome by it, to such extent that the memory of the neurotic is much diminished.

Despite the fact that consciousness and latent-consciousness are different degrees of the same psychic energy, there goes on an unremitting struggle and conflict between the two. Thus, latent-conscious impulses seeking expression are almost constantly repressed by consciousness and now and then conscious effort is balked or diverted by latent conscious interference.

The human psyche may be likened to a band of explorers, composed of singular characters, making their way through a new country. The leader of this band we will name Conscious. He is alert, keen of vision and hearing, ready for any and all emergencies. But he has a poor memory, largely because he is concerned always with the present. Constantly accompanying him, however, is an almost blind man of extraordinary memory, who acts as a sort of secretary for Conscious. This secretary is Fore-Conscious. He is ever ready to furnish his chief with important information concerning the recent past. He is the keeper of the record. The rest of the company are the Latents—a motley crew of prisoners, ignorant semi-savages and slaves. Dominant among these is a firce, strong fellow called Volition, quite loyal to Conscious, and whose business is to hold the other Latents in subjugation and obedience to the commands of Conscious. One of these Latents is a happy but irresponsible young poet, who sings always of the future, and urges Conscious to undertake ambitious and dangerous projects. He is called Hope. But there is a rival Latent, Fear, who opposes Hope and tells harrowing, imaginary tales of the dangers ahead. Conscious is swayed first by Hope, then by Fear, for both are eloquent. Perhaps the most unruly of the Latents is Love, who would have the exploration to be solely of an amourous nature. Volition is hostile towards Love, but Conscious favors him rather often, and listens to his logic. One of the most worthy Latents is Hunger, a young man who keeps Conscious reminded of the necessity for food and raiment. Love and Hunger are brothers and are the two most influential Latents, though they sometimes work against one another. Ego is a Latent whose business is to circulate among the band and keep them reminded of the importance of the expedition, its superiority to all other expeditions. In times of adversity Ego and Hope get together and put before Conscious alluring fictions of future success and ascendancy. An active Latent, who is a relative of Ego, is Revenge. His business is to keep before Conscious, as much as possible, the aggressions, slights and encroachments suffered in the past. Fore-Conscious does not seem able to remember these insults, probably because Conscious prefers not to be burdened by them. But Revenge refuses to let them be entirely forgotten, and strives constantly to represent them to Conscious, with a view to bringing about redress.

To an outsider the tactics and behavior of Conscious as a leader might seem, now and then, irrational. Such an outside observer, however, would be ignorant of the latent disturbances Conscious has to deal with. Thus, Conscious might exhibit a groundless dread, or phobia, of some form of disease, due to the machinations of Fear.

Now and then, when Conscious is confronted by some torturing difficulty, such as losing his way, for example, he is liable to listen to Fear and to take a sort of refuge from one trouble by letting Fear fasten another one, unreal in nature, upon him. Thus, under the sway of first one latent and another, Conscious is likely to do queer things, make mistakes, exhibit unreasonable obsessions of any sort.

When Conscious sleeps, Volition often relaxes his censorship of the latents somewhat and allows them to express themselves in exhibitions of dramatic type. They act out for the benefit of themselves their wishes and trends. But in order not to displease Volition too much they impersonate other people in these plays often in such wise as to disguise the real meaning of their actions and speech. Now and then Conscious half awakens and is cognizant of the behavior of the latents in their harmless manifestations of what they want. If they become too ambitious and daring in their play, Conscious wakes up and Volition immediately stops the show, and puts every latent back into his place of subjugation. (Illustrative of dream activity.)

Occasionally it happens that Volition is unable to quell an uprising or revolt on the part of one or more latents. Then Conscious may be for a time taken prisoner and Revenge, for example, may usurp his place, leading the band into all sorts of insane folly.

The foregoing allegorical parallel illustrates roughly the modern conception of the relationships of the conscious, fore-conscious, and latent-conscious mental forces. It shows, too, how the strivings of the latent factors of the mind may be responsible for this or that phobia, obsession, psychosis, etc.

Freud and Jung lay most stress upon the sexual libido, or energy, as a latent-conscious element likely through arrested or perverted development to become the chief cause of psycho-neurotic disorder. Undoubtedly there are many cases in which the love-complex in some form is the disturbing factor-in-chief.

Adler believes that a more important latent cause of the neurotic character is what he calls the "masculine protest"—a psychic reaction against the feeling of inferiority which persons of neurotic heredity or of organic inferiority regularly experience early in life. Such persons build a fictive future of importance and power for themselves as a compensation and defense against this sense of inferiority. But their exaggerated "ego-consciousness" comes to grief too often when subjected to the rebuffs of reality; hence results the necessity for further readjustments, further fictions and further neurotic manifestations.

As one outcome of the analysis of a number of psycho-neurotic cases, the writer thinks retaliation, or rather the repression of retaliation, is at the root of many psycho-neurotic disorders. Revenge is one of the most primitive and persistent of human impulses; yet along with the development of civilization the expression of this impulse becomes progressively less feasible. In consequence the latent consciousness of most neurotics is surcharged with impotent spite and longing for redress. In support of this view may be cited the frequent occurrence of retaliation dreams, analyses of several of which have been published by the writer in the *Psycho-Analytic Review*.

In practical analysis of the dreams, free-associations, and errors of speech and conduct of patients, however, it is obvious that not one but several latent factors co-operate in each case to produce the neurosis. Thus we regularly find latent strivings not only for revenge and compensation but also the masculine protest, the procreative protest and the striving for escape from conflict with reality.

Patients too old—above fifty-five—or too young—under fifteen, are not accessible, so far as latent conscious disturbances are concerned. Again, those of proper age may, not be sufficiently intelligent or cooperative to admit of successful treatment. But it is gratifying how many psycho-neurotics, whether hysterical, suicidal, paranoid, phobic, obsessed, or addicted to whiskey or drugs, will respond gradually but surely to painstaking and intelligent psycho-analysis and re-education of their latent mentalities.

The opponents to psycho-analytic work, one must conclude, are those who have not given the subject open-minded and thorough investigation.

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NEURASTHENIA.

By

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THERE are two nervous diseases of the functional class, par excellence, hysteria and neurasthenia. The history of hysteria shows a progressive tendency towards greater precision of thought, towards a limitation of the disease from the vague and misty circle of everything which seems "hysterical," down to the cases which (1) *are absolutely proven not to be organic*, and (2) present some of the *definite* criteria by which to-day we reckon hysteria, the paralyses, anesthesias, etc.

Among all the innumerable symptoms which belong to "neurasthenia," the feeling of fatigue, the easy exhaustibility, the irritability and other emotional disturbances chiefly of the depressive type, the multifarious bodily pains and sensations and the fear of places, etc., where are we to draw the line in order to obtain a more definite clinical picture? Wide differences of opinion exist. While for many, "nervous prostration" is *the* nervous disease of the age; for others, it does not exist. When neurasthenic symptoms follow clearly traceable causes, such as influenza, trauma, sunstroke, calling the symptoms sequelae of those conditions answers all present needs of medicine.

In such a maze it would not seem easy to get one's bearings, yet there is one method which can yield definite results. In regard to hysteria, Gowers sounded the keynote when he said that the disease was not to be diagnosed because the patient offered some symptoms which it was fashionable to regard as "hysterical," but only because it had been definitely established that the patient had no organic disease to account for the symptoms, and that in the examination every symptom of organic disease was to be allowed its full weight. What is true for hysteria is also true for all functional diseases. The only way in which the diagnosis of functional disturbances of the heart can be established, is as a disturbance for which the most rigid examination discloses no organic basis. This method, then, is the only sound clinical method, and it leads at once to the consideration of the question of how to conduct the examination for a patient presenting the symptoms of "nervous prostration." As regards the symptoms themselves, they might be said to cover everything, so numerous are they. This overluxuriance has led to cases being classified into cerebral, spinal, cardiac, etc. It is, however, rather more important to recognize the more distinctive symptoms which are the fatigue symptom in all its various manifestations, as repugnance to exertion and to any kind of thought, and its correlated symptom, the easy exhaustibility; the feeling of pressure in the head—frequently as though a band were drawn around the forehead; the uniformly or predominantly depressive mental tone, usually associated with irritability; the usual daily rhythm of "worse in morning and better towards night"—form a grouping to which associate themselves in every given case a host of more special symptoms which often dominate the clinical picture. These symptoms may in one case suggest cardiac, in another, gastro-intestinal disorder; or they may be primarily suggestive of nervous disease, or they may involve the reproductive system (dysmenorrhea or abnormally frequent emissions).

As above remarked, nothing but a thorough examination—not one of the ear-on-the-chest and finger-on-the-pulse kind—will put one on the right track. It must be all embracing, and each organ must be passed in review as though it were the only one in which there was any question of disease. The heart, its outlines and the condition of the valves, but especially the functional capability of its muscle, for it is only the bearing upon this final question, that gives to valvular and other lesions their importance. The lungs, especially for signs of early tuberculosis. The stomach, by inflation, for position and size. The intestines, for enteroptosis, for indigestion and putrefaction, by the test for indican in the urine. The colon, for dilatation and chronic stasis of feces. The kidneys, for mobility and for nephritis. Perhaps neurasthenia is as often indigestion as anything else: that is, an auto-intoxication from products of gastric, but more especially intestinal, putrefaction.

The viscera having been passed in review, general diseases have to be sought for and excluded, especially early tuberculosis, cancer, exophthalmic goitre, gout; also the occupation poisonings, such as plumbism, etc. The condition of the blood in case any indication is found, should be investigated.

Having finished what might be termed the general examination, the examination from the standpoint of the neurologist is begun. There is no special mystery about it; only the conscientious following-out of all the threads, any one of which may lead the examiner out of the labyrinth into the clear light of day.

The central idea in a neurological examination is the *constant comparison of points symmetrically situated on the two sides.* By this comparison, which can be made as detailed as necessary in the given case, we ascertain whether any difference exists in the action of the two sides, or in the sensation of the two sides. The power of the two arms, and legs, the grasp of the hands, the power of the extensors of the feet (weakness of which in combination with absence of knee jerks, speaks for alcoholic polyneuritis), the symmetry of movement of the two sides of the face, of the eyelids, of the eyes in all directions, of the tongue—all these carefully tested without the disclosing of any difference, warrant one in saying that no defect of motility exists.

Similarly for sensation: Comparative tests of the two sides with light touches of cotton wool, the patient's eyes being, of course, closed, will reveal any departure from the normal. The special senses are then tested. The eyes for acuteness and extent of vision (absence of contraction of the visual field); the ears for the distance at which each hears a watch, the other being closed, and, in case of defect, for the amount of hearing with the watch laid upon the skull (bone conduction, absent in nervous deafness). Finally, pain, temperature, smell and taste, can be similarly tested where any indication seems present. The reflexes are then examined into; the knee-jerks being the type of the tendon reflexes, the plantars that of the skin reflexes. Also the reaction of the pupils to light. Lastly the power of the patient to coordinate; to stand with the feet together and eyes closed, to button his clothes, to enunciate words distinctly, etc.

I have been thus explicit, almost I fear to the point of tediousness, because the neurological examination is too apt to be regarded as a thing apart, something beyond the possibilities of every-day practice. Yet, as I have tried to show, there is really nothing in it beyond the power of any careful clinician. Indeed, if to the above scheme were to be added the ophthalmological examination of the fundus and the electrical examination, which is not often necessary, one would have everything carried out by the most exacting specialist.

There now only remains one group of affections with which neurasthenia can be confounded—the mental disorders. And, in fact, it is probably more often confounded with them than with other conditions; especially with those lighter grades of mental disorder which do not find their way into the insane hospitals.

Kraepelin points out that neurasthenia is too convenient and easy a diagnosis not to have become popular. And he emphasizes the importance of early discrimination before, let us say, a general paralytic has become entangled in heavy business losses, or possibly has slain one of the family in a sudden access of blind fury; before a dementia praecox has bankrupted the family for sanatorium treatment which in the nature of the case must be useless, etc.

Among mental disorders, neurasthenia is perhaps most often confounded with incipient general paralysis. Both may offer the easy exhaustibility, the dislike of work, the easy irritability in connection, it may be, with a feeling of weakness, headache, insomnia and vertigo. Here mistake in diagnosis can be avoided by recurrence to first principles, that neurasthenia shall be such only because it cannot be anything else. A careful search of bodily signs, inequality of pupils (worth little by itself, but much in association with sluggish reaction on the dilated side), for absent knee-jerks, for beginning speech defect; on the mental side, for evidence of slight but deep defects; the age and sex, and, to a certain extent, a history of previous syphilis, and the fact that the general paralytic is quite apt to show a rather decided under-appreciation of his bodily symptoms in sharp contrast to the keen over-realization of the neurasthenic; also general paralysis is apt to lack an obvious sufficient cause.

The diagnosis is at times also quite difficult from beginning dementia praecox (adolescent insanity, so-called), many of the long-drawn-out cases of which pass for years as neurasthenia. Here it is important to recognize the presence of a peculiar, progressive dementia characterized by weakness of judgment (often exhibited in the bizarre nature of the hypochondriacal delusions), the emotional apathy, the poverty of thought, the loss of ambition, groundless laughter, and foolish, childish behavior; and, later on, the mannerisms, stereotyped actions, and negativism. Also the age is important, nearly all dementia praecox developing before 25, while acquired neurasthenia is rare till after that age.

Also the lighter grades of the melancholias; those grades which rarely come under the alienist's care are very liable to be mistaken for neurasthenia. Especially is this true of the cases of circular insanity (Kraepelin's manic-depressive group). These cases are those of individuals who during their whole lives are rarely normal; they are either above or below the plane of mental health; either unduly elated, or unduly depressed; usually an alternation of the two. The recognition of the distinction is here of importance as suicide is much more frequent than with pure neurasthenics. In these cases of circular depression (for it is chiefly the depressed phase which is liable to be mistaken for neurasthenia), medication has no effect, no improvement occurring until a change takes place in the emotional state; a change which is entirely generated within, of itself, and without assignable cause. This fact, and especially the existence of previous attacks of a similar kind which upon "recovery" very likely passes over into a heightened emotional stage, suffice for the diagnosis, even though a sufficient cause may seem to be present for the individual attack. Then, too, the proportionately more rapid development and the predominance of the emotional tone, are important marks.

From hysteria, the diagnosis should not be very difficult in typical cases; though there is, of course, nothing in either disease which renders the patient immune against the other, especially when both develop upon the same neurotic basis. Hysteria presents a number of somewhat definite marks; especially the paralyses and the anesthesiae, whose distribution and course (suddenly appearing, suddenly disappearing) are characteristic; convulsions, disturbances of the color sense, form a picture which when at all rounded out, ought not to be mistaken. Also the course in hysteria is far more changeable, in connection with emotional factors, than in neurasthenia, in which there is a more uniform depression. Hysteria is, moreover, predominantly a disease of females, whereas neurasthenia is more common in males.

As regards treatment, it is more than probable that the examination will have disclosed indications, that is, that with our increased precision in examination, so-called simple, pure neurasthenia will become correspondingly rare. But supposing that the negative result of the examination leaves us in the presence of such a case, the treatment should embrace rest and isolation, massage, electricity and hydrotherapy, super-alimentation and drugs. The personality of the nurse in charge of such a case is most important. A tactful, resourceful nurse, one who can preserve an equable, cheerful demeanor and can divert the patient from his gloomy forebodings and autoclinical observations, is a great desideratum. Such a nurse can do much to render the principle of isolation effective. The intent of the principle is, of course, the isolation of the patient from a circle of over-sympathetic friends with whom the comparative merits of remedies and the wonderful cures of Dr. so-and-so, are, no doubt, matters of frequent cheering (?) sick-room conversation. The physician would impress his patient with confidence, make him believe that he understands his case, that he is going to get well, and when the setbacks come, as come they will, allow the patient to see that the physician is not discouraged, that he had counted them in advance, and that his opinion is unchanged. The patient should be instructed to talk over his condition with no one except his physician.

In conclusion, it is a somewhat trite remark that there is no condition which, take it all in all, taxes more the patience and skill of the physician than the successful management of a case of neurasthenia. Yet it is a condition for which much can be done by the proper co-partnership of the physician and patient.

THE DOCTOR IN COURT.*

By

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Professional Evidence.

THE physician or surgeon, no matter whether his practice be general or special, is certain to be called upon to give medical evidence in court. This cannot be avoided, as cases are constantly arising which involve questions of personal injuries, of mental capacity, and of death, either accidental, homicidal or suicidal. The doctor has no choice in the matter. He cannot tell in what case he will be summoned into court to testify. If called he must go. Because of the publicity of court proceedings a reputation may be won or lost. Consequently it is of great importance for a doctor to know his relations to the court and have his eyes open to the pitfalls set for him by the skilful cross-examiner.

The witnesses giving sworn evidence before a tribunal of justice may be placed in two groups, the accidental or non-expert witness and the professional or expert witness. It is manifest the doctor may be called to give testimony in either capacity. The greater number of facts investigated in our courts are testified to by the first group, the jury drawing inferences or conclusions from the facts as given by these witnesses. Back in the early years of our courts this was the sole type of testimony, for the reason that it was the only kind necessary for a jury to render just decisions. Yet with the advancement of learning it became visible that facts and natural laws existed concerning which the average man or jury knew but little. It was necessary to have the aid of one who could correctly interpret these facts. So it came to pass that the expert was evolved to assist the court and jury to a true conclusion as to these facts. Since that time the expert witness's importance as an instrumentality for the dispensation of justice has increased immensely. The discoveries and inventions of science have widened his field of usefulness illimitably.

Now, the examination of a witness in court consists of the direct or examination-in-chief, the cross-examination, and the re-direct examination. The examination-in-chief is where the side calling the witness into court questions him as to his knowledge of the facts in issue, or, in the case of an expert, where the side for which he is testifying puts hypothetical questions to him for his opinion thereon. The cross-examination is conducted by the opposing counsel. Its purpose is to test the truth of the evidence given upon the examination-in-chief, and the prejudice, memory, knowledge, interest, etc., of the witness. The importance of the right of cross-examination can be seen from the very nature of our system of legal procedure; for example, hearsay evidence, where a witness testifies as to what another said, is inadmissible because the person making the statement was not subject to cross-examination; and for the same reason opinions expressed in the works of scientific writers are not generally allowed. (Other reasons for excluding hearsay evidence are that the person making the statement was not under oath at the time, nor was he before the jury so that they could pass on his veracity of a witness.)

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There are many exceptions to the hearsay rule. The one with which the physician is most concerned is the rule admitting dying declarations, provided the declarant knew or believed he was about to die when he made the statement and his death is the subject of the indictment. An illustration of the serious consequences which might attend the curtailing of one's right to the cross-examination of witnesses is furnished by the very late New York case of the People vs. Lustig (206 N. Y., 162). The prisoner was indicted for poisoning his wife with strychnine in order to get the insurance on her life. There was a divergence in the medical opinions as to the cause of death. The chief medical witness for the prosecution gave evidence that his toxicological tests had revealed one one-hundredth of a grain of strychnine in the liver of the deceased. The physician for the defense testified that the result of his laboratory work showed no traces of strychnine. With the object of showing the worthlessness of his own tests the prosecution's expert was asked by the prisoner's counsel to discribe his tests. The accused's fate depended upon the accuracy of the physician's work. Did the woman die by poison? The issue was close; a human life was in the balance. Yet the court refused to permit the witness to answer. The higher court justly held this to be serious and reversible error. A new trial was granted.

Immediately on being called to the stand for his examination the oath is administered to the witness which binds him if he assents, to tell "the truth, the whole truth, and nothing but the truth." It has been said that expert testimony should be the colorless light of science brought to bear upon any case where such testimony is necessary. "There should be no half truths uttered, and suppression of the whole truth is in the nature of false testimony." While such evidence should be impartial and unprejudiced, it is often thought by the expert that to benefit the side calling him he must be absolutely sure that he is right. A conscientious and unpurchasable expert will, of course, have the courage of his convictions. Testimony given in a convincing manner undoubtedly carries weight, but so many theories in medicine and surgery have been upset that it is best not to be too confident.

That the skilled witness may be admirably qualified to give evidence and at the same time be modest and not at all sure of the truth of his opinion, is illustrated by the following: Not long ago a captain in the United States army was called as a skilled witness in a shooting case. The captain astonished all by refusing to swear he could tell the truth. The clerk repeated the oath; the captain did not assent; he said, "No, sir." It was not a case of obstinacy, because the witness was willing to do anything he could to assist the court and jury in getting at the facts. Nevertheless, he refused to swear that his conclusions were correct.

The judge was puzzled, and the captain made the following explanation of his refusal to assent to the oath: "I decline to swear that the expert testimony which I may give is the truth. All that I can swear to is that to the best of my ability and understanding and judgment, after years of experience and experiments in the matter of small firearms, certain conditions produce certain results. But I cannot swear such findings are the truth."

He was accepted as a witness. The effect of what he said on the jury can be imagined. Here was a man who was not positive that his opinion was right, and was willing to say so, regardless of its effect on the side that called him. The testimony of such a man was worthy of serious consideration. This attitude can be strongly recommended to medical witnesses when they take the stand.

It cannot be denied that expert testimony is winked at. It should have high rank as a factor in determining the outcome of cases, yet we often see it go for naught. Some judges go so far as to tell juries that it is of little probative value. Thus at the trial of William Palmer, at the Old Bailey in 1856, for the poisoning of a man named Cook, Lord Chief Justice Campbell, in the course of his summary, said to the jury: "With regard to the medical witnesses, I must observe that, although there were among them gentlemen of high honor, consummate integrity, and profound scientific knowledge, who came here with a sincere wish to speak the truth, there were also gentlemen whose object was to procure an acquittal of the prisoner. It is, in my opinion, indispensable to the administration of justice that a witness should not be turned into an advocate, nor an advocate into a witness."

In a New York case (Ferguson vs. Hubbell, 97 N. Y., 507 at 514) the court said: "Better results will generally be reached by taking the impartial, unbiased judgments of twelve jurors of common sense and common experience than can be obtained by taking the opinions of experts, if not generally hired, at least friendly, whose opinions cannot fail generally to be warped by a desire to promote the cause in which they are enlisted."

Despite this judicial denunciation of expert testimony innumerable instances of the courts recognizing the knowledge and experience of medical witnesses as of great value might be cited. In many cases it is absolutely indispensable because of the rule of law requiring the production of the best evidence. Who but a toxicologist can give a correct opinion as to whether or not a man came to his death by poisoning? From the position which experts now hold in legal proceedings it is not unnatural that a great hue and cry should be raised to abolish a system which permits such farces as the Thaw trial to be enacted in our courts. But remove the expert to a non-partisan position by having him appointed by the court and great distance will be covered in the direction of genuine reform. When juries come to look upon the expert more as an officer or servant of the court than as one giving evidence to fortify either side of a case, then the profession will be treated with greater respect and not held up to ridicule. Like the army captain, let the medical witness have constant regard to the serious obligation of his oath, and much of the present misunderstanding of the expert will be dispelled.

Naturally when a skilled witness is called to the stand to give evidence, the question at once arises as to whether he is in fact an expert. Accordingly the foundation for an expert opinion is laid by qualifying the witness as such. The doctor is interrogated as to his education, experience, etc., after which, and before going on with his testimony, he may be taken in hand and cross-examined as to his qualifications. The court then decides whether he shall be permitted to testify. In other words, the presiding justice rules upon the question of the doctor's competency as a witness.

The law does not recognize any particular school or class of medical practitioners as being better qualified than another for skilled witnesses. The criterion is knowledge. This knowledge may be gained by reading and studying the books, or by experience, or both. The present low status of the expert is also attributed to the low standards set for experts, which, it is said permit the pseudo-expert to thrust himself upon the courts. Civil service examinations have been suggested as a remedy, but if, as recommended, medical witnesses were chosen by the court, it would insure science being interpreted by experts.

In the direct examination the witness should state the facts simply, without qualifying words. If he says the patient suffered from a "very severe nervous shock," this is certain to be picked up on the cross-examination. It is sometimes necessary to use technical words in order to complete the record of the court, so that another medical witness coming into court at some later time can tell exactly what was meant. When such terms are essential be sure to explain them in plain words to the jury. Taylor tells of a case where a doctor testified "that on examining the prosecutor he found him suffering from a severe contusion of the integuments under the left orbit, with great extravasation of blood and ecchymosis in the surrounding cellular tissue, which was in a tumefied state. There is also considerable abrasion of the cuticle." On being asked if he meant a black eye, he said "yes." The doctor was laughed out of court. If this witness had stated the patient had a black eye, then, if pressed and asked what he meant by a black eye, had given a technical description, that would in all probability have relieved him of further examination.

Where, however, the doctor is acting purely as an expert it may not be so easy a task to give answers wholly devoid of medical phraseology. Dr. Reynold Webb Wilcox in his inaugural address as president of the Society of Medical Jurisprudence said: "To a man who is a specialist, the demand which almost invariably occurs, that his scientific analysis of a situation be translated into the vernacular of every-day speech, is maddening. The popular idea that present-day physicians delight in amplifying a medical vocabulary for the purpose of hearing lengthy words, is far from being founded upon fact. The tendency is in exactly the opposite direction.

"No one who knows anything about literature would expect the translator of an idiomatic bit of French verse to obtain in English exactly the same meaning. Yet medical men of international reputation are asked to describe a state of mental disorder in one-syllable words, conceived by our ancestors, in an era when it was scarcely realized that the brain was part of the human system. I do not advocate having the experts' testimony tuned so high that the jury and judge are in the dark, but it does seem that the means should be taken to impart to them the rudiments of medical phraseology."

Efficiency in the high art of cross-examination is a matter upon which a great many lawyers pride themselves. Perhaps no greater opportunity for the trial lawyer to distinguish himself is afforded than the cross-examination of expert witnesses. Extended preparation with the object of undermining the testimony of medical witnesses is often made under the tutorship of other experts. Ingeniously contrived questions are set for the witness. So the doctor must beware the cross-examination.

It is not presumed here for a minute that the physician would testify falsely. The lying witness is generally very easy to corner. Even the cleverest will make a fatal slip sooner or later. As a matter of fact, the cross-examiner must treat the medical witness's testimony with skepticism. This is the attitude of the advocate's mind in approaching any witness if the witness has given testimony conflicting with that already advanced or to be offered by the examiner's side. It is a mistake to believe that when the lawyer rises for the cross-examination his sole object is to make the witness out a liar. He will undoubtedly try to prove his own case from the lips of the witness or some theory not incompatible therewith. This method of turning testimony in favor of the questioner's side is followed by the majority of cross-examiners. It does not mean that he is trying to trip the witness, because what he seeks to bring out has in all probability not been touched on in the examination-in-chief. Naturally an attorney is not going to ask his own witnesses for facts which he knows are damaging to his cause. He leaves them for the opposition to bring out; it is for these the cross-questioner seeks.

For illustration: In a suit for personal injuries against a railroad company, where the plaintiff suffered a fracture of his leg which resulted in a shortening of the limb, the attending physician testified that "the condition was a simple transverse fracture at the junction of the middle and upper third of the femur. That after reduction and the application of dressings an x-ray plate showed a perfect anterioposterior alignment." A liberal verdict was returned for the plaintiff. The doctor subsequently in conversation with a friend said that he had other x-ray plates taken at various angles showing there was an overlapping of the ends of the bones due to his improper application of dressings. Here a proper cross-examination would have brought out this fact and damages would have been greatly mitigated. By failure to properly cross-examine the witness the defendant was paying for the doctor's carelessness.

A common tactic of the trial lawyer in cross-examining a witness is to attempt the witness's downfall by showing that the witness is "interested" in the outcome of the case. The physician is asked how he happened to come into the case. He is carefully examined as to whether he has received compensation for his services in attending the patient, or how much he is to receive for appearing as an expert. If an unsatisfactory reply is given, the attorney may use the fruits of such a line of questioning in his argument to discount and nullify the physician's testimony. The advocate will try to persuade the jury that the doctor's being paid is a contingency dependent upon a favorable verdict, and that the testimony of one so interested must necessarily be highly colored.

Many lawyers believe a most cursory reading of medical authorities will qualify them to successfully cross-question the greatest specialists upon their own subjects. A true expert can easily defend himself against the attacks of such an antagonist, but no matter how strongly he may be tempted to strike back let him resist the impulse. It is poor taste to engage in repartee. Medical witnesses in general have been hurt by the physician not long out of medical school matching wits and bandying words with counsel. The latter has the advantage from his position as questioner. Naturally the lawyer knows more about the art of cross-examination than the average witness; for it is part of the practice of his profession, just as it is part of the physician's to prescribe for illnesses. True, the advocate frequently runs himself on his own sword; but the average lawyer is more proficient in the art than the medical witness.

When the physician is tormented by a member of the Spanish Inquisition school of cross-examination, he should above all things keep his temper. This species of examiner is not half as deadly as the quiet, friendly, persuasive type. But it is important always to be cool while on the stand. If a cross-examiner sees that he can get the witness angry, he will do all in his power to bring this about. For the witness then thinks more of a means of retaliation and not so much of what he is saying, thus making it easier for the examiner to trap him in a statement carelessly inconsistent, or the witness may utter an unguarded statement.

In giving his opinion the expert cannot usurp the right of the jury to judge the facts. The expert is not to say which witnesses are telling the truth. That is for the jury to decide. "In order," says the Supreme Judicial Court of Massachusetts (Dickenson vs. Fitchburg, 13 Gray, 546), "to obtain the opinion of a witness on matters not depending on general knowledge, but on facts not testified of by himself, one of two modes is pursued: either the witness is present and hears all the testimony, or the testimony is summed up in the question put to him; and in either case the question is put to him hypothetically, whether, if certain facts testified of are true, he can form an opinion, and what that opinion is."

Now a hypothetical question is framed on the existence of facts which are assumed to be then proven, or there is a reasonable expectancy that they will be in evidence at a later time. It must necessarily contain the facts on which an opinion is wanted. It is for the jury to decide whether these facts are the truth.

The following is a good example of a hypothetical question which was put to a physician of standing and experience, for his opinion as to the cause of a sickness, the outcome of which was the death of a little girl: "Suppose a girl between seven and eight years of age, who had always been in good health, on the 9th of January, 1887, to have been run over by a runaway horse, with sleigh attached, to have been knocked insensible to the ground, the horse and sleigh passing over her, inflicting three cuts, one upon the top, one upon the side, and one upon the back of her head, from the hoofs of the horse or otherwise; that she thereafter was attacked with vomiting, and was confined to the house for two months, suffering great pain in the back and front of the head; that at intervals thereafter increasing in frequency and intensity till the date of her death, on May 18, 1892, she was attacked with violent pains in the head accompanied with vomiting; that in the last few months of her life her sight gradually failed, and she became totally blind; that her legs became unsteady, and her control over them uncertain; that she suffered almost continually great pain in the front and back of her head; that after her death, on examination, it was found that she had one or more tumors of the cerebellum, or at the base of the brain—what, in your opinion, was the exciting cause of the illness from which she suffered from January 9, 1887, the date of the accident, till the date of her death, May 18, 1892?" (Hardiman vs. Brown, 162 Mass., 585.)

Leading questions cannot, as a general rule, be asked on the direct examination, but are permissible on the cross-examination. A leading question is one that suggests the answer. On the examination-in-chief the question would be worded, "Where were you at 9 o'clock on the night of February 16th?" Answer, "I was at the theatre." In cross-examining this witness the question could be, "Were you not at the theatre on the night of February 16th?"

The witness should watch on the cross-examination for questions so involved as to contain really two questions, one of which can be answered "yes" and the other "no," whereas if the physician answered the whole with a "yes" or "no," it would trap him. The witness should not hesitate to say that the question has two answers.

Again, many times questions are asked which assume something to be true that has no evidence to support it, as where A is indicted for shooting B, which he denies, and is asked, "Did B say anything to you before you shot him?" The doctor is likely to get a question of this description. It is, of course, improper. They are put to the witness on the chance of getting them into the record unchallenged.

The medical witness need not answer a question which tends to incriminate him. Poore (A Treatise on Medical Jurisprudence) says that "in the old days of duelling any doctor who went out as a surgeon to a duel became an accessory to the fact if the dual resulted in death. Technically he became accessory to a murder. Therefore, in such a case if the doctor was asked whether he went, knowing that a duel was to be fought, he was not bound to answer, because the answer to it might incriminate him."

The use of notes by a witness in court is generally allowed for the purpose of refreshing the memory of the witness. They must be of such a nature that the witness knows they were correct when made. The witness must have made them himself at the time of the occurrence of the facts, or so soon afterward that it is likely they were fresh in his memory (Stephens' Digest of the Law of Evidence, 339). Such writings do not become evidence. Yet testimony given from complete notes is of great worth.

The importance to the physician of keeping full and accurate records of cases in his charge cannot be overemphasized. The physician should keep copies of the death certificates he gives, and the records of the progress of diseases in cases under his care and also hospital records, especially where casualties are concerned. General practitioners are, as a rule, too careless in such matters.

It may be many years before a general practitioner is suddenly summoned as a witness in a case, and he then finds himself at a loss to account for certain things and cannot answer questions properly. Owing to the multiplicity of personal injury suits with which our courts are congested, the physician is frequently asked to give medical evidence concerning injuries sustained by his patient in an accident which, perhaps, happened years before. If he is without any record he will find himself in an embarrassing situation. In almost every personal injury case the plaintiff has undergone a physical examination by a physician or surgeon hired by the defendant. If called to make such an examination, a record thereof should be made for the benefit of the defendant. The following outline for making these reports is suggested:

Name of Case.
Date.
Time.

Place of Accident.
Date of Examination.
Medical Attendance, stating fully names of physicians with addresses, also hospital, if any, at which injured was treated.
Name.
Age.
Occupation.
Business and Home Address of Injured.
Married or Single, etc.
Diagnosis.
History.
Present Condition of Injured.
Nature of the Accident as told by Injured.
Prognosis.
Remarks.

The "remarks" of the physician should be written on a *separate sheet* of paper; for if the report is to be used by the doctor to refresh his memory in court, it is likely to be scrutinized by the opposing counsel, and it is well not to have these confidential comments a part of the report.

While the rules governing the giving of expert medical opinions in court are purely questions of evidence with which the legal profession is more concerned, still they have been hinted at here, and it does not seem amiss to give the underlying reasons for permitting medical witnesses to give opinions. As a general rule witnesses are not permitted to voice their opinions in court. They are limited to giving in evidence the bare facts of which they have knowledge. It is the special function of the jury after considering the facts thus presented to voice its opinion thereon. In other words, a verdict is the conclusion or opinion of the jury on the facts.

Notwithstanding this, there are, as we have seen, certain cases where by necessity one having special skill and knowledge, is called to give an opinion by way of explanation of the matter in issue to the jury. It is under this exception that the expert medical opinion comes. Obviously a physician and surgeon has a knowledge and training not common to men in general. Consequently when a question involving medicine or surgery arises, the medical expert is called on account of his superior knowledge. Because the facts speak in a strange tongue to the ordinary man, the physician is called to translate and explain their correct significance. The opinions so given are not conclusive, but are looked upon as any other testimony. Inasmuch as they are based on assumptions of fact the opinion is worthless if the jury do not find the evidence or facts upon which they are laid to be true: if the foundation is unstable the superstructure falls.

The giving of expert opinions in court did not become well established until the eighteenth century. The adoption of the custom has been gradual; its history is that of the correlation of law and medicine. As progress was made in the sciences and arts the professional witness became of ever-increasing importance, until today he is indispensable.

In 1532 the diet of Ratisbon, at the instigation of Emperor Charles V, adopted the penal code of Germany, in which provision was made for the calling of physicians as witnesses in case of injury, poisoning, violent death, etc.

In England it was first customary to select jurors who were specially fitted to judge the facts of a particular case (Historical and Practical Considerations Regarding Expert Testimony, by Learned Hand, Vol. 15, Harv. Law Rev., 40). Probably the earliest trial where a medical witness testified as to his conclusions was that of Alsop vs. Bowtrell (Cro. Jac., 54) in 1620, when physicians upon the issue of legitimacy of a child said it was possible for a woman to have a child forty weeks and nine days after the death of her husband, because the time might be delayed on account of lack of strength or bad usage. The Witches case (6 Howell, State Trials, 697) tried in 1665, is another early case in which an expert opinion was permitted. In that trial a physician gave his opinion of the accused persons. He declared them to be witches.

Because of the very restricted sense in which medical books can be used in our courts, the deliberately expressed opinions of experts upon scientific matters is of great assistance. A product of our civilization, the employment of the expert daily becomes more frequent and of greater consequence. The desire, therefore, to remedy the faults of the method which now obtains is actively manifesting itself. Yet the task of formulating a satisfactory plan still vexes the members of both professions. Many reforms have been suggested. That one which would have the expert appointed by the court gives most promise of deliverance from the present situation. For the evils of the system seem chargeable to the fact that the expert is now retained by the contending parties in a case. His position is that of an active, interested participant. The suspicion that he is a mere "intellectual prostitute" is immediately aroused in the minds of the jury. His appointment by the court would remove him from this embarrassing situation and place him in an unprejudiced and neutral position. The viciousness of the present method has brought forth just criticism and reproach. It is a subject which deserves serious reformatory consideration. The remedy lies with the members of both professions (Expert Testimony,—Prevalent Complaints and Proposed Remedies by Judge William L. Foster, 11 Harv. Law Rev., 169; Expert Testimony, by Lee Max Friedman, Yale Law Journal, February, 1910).

When the physician and surgeon is called upon to give evidence in court he should bear in mind the advice of Dr. Taylor. "It is essential," said Taylor, "first, that he should be prepared on all parts of the subject on which he is about to give evidence; and, secondly, his demeanor should be that of an educated gentleman and suited to the serious occasion on which he appears."

THE CHRONIC ALCOHOLIC AS A STATE PROBLEM.

By

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THE problem of the reformation of the chronic alcoholic is as old as literature. In 2000 B. C. Amen-en-an, an Egyptian priest, in a latter to a pupil reminded him of his pledge in the following words. "I, thy superior, forbid thee to go to taverns, thou art degraded like the beast. The Gods regard not the breaker of pledges." In 2285 B. C. the Emperor of China banished a man for concocting an intoxicating liquid from rice. In 2000 B. C. Yao, the Great, enforced prohibiton in China, and according to Mencius, "Virtue pervaded the land and crime was unknown for many years." Later a bibulous ruler led the Chinese people back to drunkenness. In 202 B. C. an anti-treating law was passed in China, but this failed to control inebriety. In 98 B. C. government ownership was tried; but this likewise proved ineffective. In 459 A. D. China adopted prohibition, with beheading as a penalty for selling liquor; and this policy has been followed practically ever since.

The importance of the subject of alcoholism is indicated by the voluminosity of the literature. There is probably no subject more widely discussed and upon which opinions are more diversified. Economists, sociologists, criminologists, religionists, physiologists, psychologists, pathologists and psychiatrists have all written exhaustively on the subject. Much research has been done; and so widely do the results differ that statistics can be produced to substantiate any statement one cares to make. Perhaps the most amazing are the researches of Elderton and Pearson (2), who claim to have proven that chronic alcoholics are more efficient and have larger families and brighter children than total abstainers. Equally astonishing are the findings of Bevan Lewis, who claims that the most intemperate communities have the lowest rate of pauperism and insanity.

Doubtless the diversity of opinion can be accounted for by the fact that the subject of alcoholism is one into which the personal element enters very largely, and there appears to be no neutral ground. Most writers preface their remarks by a statement that they are absolutely neutral on the subject. This alone throws suspicion on their findings. With all due respect to statistics and research, the fact remains that is patent to every thoughtful observer, that alcoholism is closely associated with crime, pauperism, feeble-mindedness, the epilepsies and the insanities, that a chronic alcoholic is a menace to the community in which he lives, a social blight and a financial burden. In California this burden is yearly becoming greater. Last year there were treated in the State Hospitals of California 732 chronic alcoholics and 192 cases suffering from alcoholic insanity, at an actual cost of $81,004.06. If to this be added the economic loss, estimating the earning capacity of each patient at $50.00 per month for 4 months, the average time of detention, we have a total loss to the State of $276,204.06 a year. This does not include the 1,312 cases in which the cause of insanity is given in the Annual Report of the State Hospitals as alcoholism and dissipation.

The number of cases that have received jail sentences on account of alcoholism in the various cities of California, is difficult even to estimate.

Treatment of inebriates in State Hospitals and jail sentences have both failed signally to effect cures for the following reasons:

1. The patients sent to State Hospitals are to a large extent incurable for reasons which will appear later. Commitment is considered the last resort.
2. The majority of the patients are sent against their will and have no desire to be cured.
3. The State Hospitals were already overfilled when the burden of the alcoholic and drug habitue was placed upon them, therefore, they cannot retain these patients sufficiently long to effect a cure.
4. To place the alcoholic with the insane is unjust to both.
5. The alcoholic and drug habitue cannot be trusted with any degree of liberty and therefore cannot be made to work to any extent; enforced idleness is harmful rather than helpful.

Treatment in a State Hospital for the Insane was a move in the right direction inasmuch as it recognized the abnormal mental condition of these individuals; but a jail sentence is absolutely unjust, unreasonable and harmful. Society having made the drunkard, has no right to punish him. The community has no right to chastise an individual for patronizing the industry which it recognizes, fosters and from which it derives its revenue. The fact that he has a defective makeup or an abnormal susceptibility to alcohol is his misfortune, not his fault. The uselessness of punishment is demonstrated by the fact that the offenders are practically always recividists. The famous case of Jane Cakebread (3), of London, who was sentenced 280 times for being drunk and disorderly, is an extreme case showing the worthlessness of punishment.

The *cause* of chronic alcoholism, like every other disease, must first be ascertained before it can be treated successfully.

Inheritance.—The theory that drunkenness is inherited is an exploded one. No child is born into the world with a craving for alcohol. What it frequently *does* inherit, however, is a weak and unstable nervous system, defective mentality and lowered resistance to disease. The parents are frequently alcoholic because they are neurotic, defective, or physically ill.

Environment.—To inheritance is often added prenatal and environmental factors which make for drunkenness. Probably the greatest factor in the production of the chronic alcoholic is environment. In many communities and in certain classes of society sociability and alcohol are inseparable. The love of excitement and new sensations is inherent in the heart of youth and although there is at first no craving for alcohol as such, the social atmosphere that furnishes the most color is the one where alcohol is most abundant. Jack London (4), in speaking of the hours spent in the saloons of San Francisco, describes them as "Purple passages flung into the monotony of my days." In explaining why he used alcohol he says, "In all the unwitting days of my youth John Barleycorn was accessible, calling to me and inviting me on every corner and on every street between the corners. The pseudo-civilization into which I was born permitted everywhere licensed shops for the sale of soul poison." In an investigation of 259 cases of alcoholism at Bellevue Hospital, New York City, Dr. Lambert found that 70 per cent. formed the drinking habit before 21 years of age. Of 65 cases studied by Partridge (5), only two began drinking alone, the remaining 63 began drinking in a social way.

Physical Disorders and Diseases are occasionally the starting-point of alcoholism, especially in women. This comes about by the careless ordering by physicians of alcohol in various forms, without stating the dose or the length of time it is to be taken, and by the use of patent medicines containing alcohol. In almost any physical disorder, alcohol gives a temporary relief from pain and a false feeling of strength and well-being. Alcohol inevitably brings a train of evils in its wake—sickness, exposure to venereal disease, and mental depression. The chronic toxic condition produced by alcohol creates a craving for something, and this is interpreted as a craving for more alcohol. When once the habit is established, either through social or solitary drinking, the alcoholic travels in a vicious circle. He drinks because he is sick, depressed and irritable, and he is sick, depressed and irritable because he drinks. He drinks to increase his mental and physical efficiency and his efficiency declines because he drinks.

Feeblemindedness is responsible for a large percentage of cases of chronic alcoholism. Just how much it is impossible to say as statistics on this subject, as on all others relating to alcoholism, differ widely. Investigation by Dr. A. H. Estabrook (6) of 850 persons of the Nam family, a defective family of New Jersey, shows that 88 per cent. of the females and 99 per cent. of the males were alcoholic. Dr. Branthwait, Inspector of Inebriate Asylums in England, states, "Two-thirds of the persons committed to reformatories are irreformable on account of their mental condition. Many of the persons sent to us under the Inebriety Act are just feebleminded persons, drunkards because they are feeble-minded." Defectives not only have less resistance to temptation than the normal individual but they show a pathological reaction to alcohol. Healy cites a case of a feeble-minded boy who got along well on parole for a year and a half. The day he took his first drink of liquor, he committed a sexual assault on a little boy.

Mental Peculiarities, Disorders and Diseases must also be considered factors in the production of alcoholism. These states are of all grades from simple mental peculiarities to fully developed psychoses. Among the former may be mentioned the careless, indifferent, irresponsible hypersuggestive individual, who drifts into drunkenness through bad environment and has not the strength of will or the desire to reform. Alcoholic dementia follows with its characteristic lack of ethical and moral sense, selfishness, untruthfulness, emotional deterioration and conduct disorders. Later, there is an impairment of all the mental faculties.

The moral coward also belongs to this class. Not having the courage to suicide, he seeks in alcoholism a temporary relief from cares and worries which he has not the moral courage to face. Omar Khayyam voiced this sentiment when he wrote:

> "Endure the world without my cup, I cannot
> Drag on Life's load without my cup, I cannot."

Prostitutes who are not feeble-minded frequently belong to this class of persons. They drink to deaden their sensibilities and to secure a temporary forgetfulness of a hopeless situation from which they see no release.

Neuropathic any psychopathic persons are specially prone to form the alcoholic habit. To this class often belongs the super-normal, brilliant, one-sided individual known as the genius. Lombroso (8) gives a long list of famous sculptors, painters, poets, authors, statesmen, actors and musicians who were alcohol or drug habitues. The reason for their over-indulgence could probably be traced to emotional instability, which is prominent in this type of person. Among these may be found the constitutionally hypomanic and the constitutionally depressed, the neurasthenic and the psychasthenic. The following is an extract from a letter written to me by an unusually brilliant woman who, in the past three years, has been an inmate of three State Hospitals, and several private sanitaria for the treatment of chronic alcoholism:

"Yet I have suffered. Four years ago I noticed a great change in myself. Every Saturday I was prostrated, suffering from pain in my head. When three o'clock came I lay down, tired and exhausted. Every neurasthenic symptom was present, long sleepless nights, headaches and misery. Then I developed the hypersensitiveness to sound. I went through Hades. I sat in the park and went down into deepest depression. To this day I have a morbid dislike of trees and grasses. I really dislike the country. At home, I received no sympathy. I never spoke of my ills and the idea of a dog's bark making one cry and shudder was considered ridiculous. The pathological side was not recognized. I was finally sent to ———— Sanitarium. Here I lived on bromide and sleeping powders for weeks and weeks until I refused them. I know now that the nervousness and sickness that followed was the ill effects of these drugs. After I left the Sanitarium, I studied and read constantly, trying to counteract the bitter thoughts that crowded in on me. I took up psychology and I read every work in the Doctor's well-stocked library; all Kraepelin's, Mendel's, Freud's and every work I could lay my hands on together with all the medical journals. Every authority on the use of intoxicants, I read, but the theoretical knowledge helps very little in practical experience. Really, I am so sick of psychiatrists and neurologists, knowing how little I have been benefited, that I would like to go to the Fiji Islands, where there are none of them. My life spells *failure*. My mother sits alone now, lonesome, without a daughter's care. I am here, after a lifetime's hard work, seated in a State dress."

What this patient omitted to mention is the fact that she is absolutely incapable of telling the truth. Whether this is due to the alcoholic deterioration resulting from twenty years of steady drinking or to a constitutional defect, it is impossible to say. The picture she draws of her mental depression is probably accurate, as her family state that she was always depressed, pessimistic and morbid.

A similar case is that of a young woman, twenty-three years of age, mentally above the average. This patient, having gone the rounds of private sanitaria, state hospitals and private practitioners became well informed in what was expected of her in the way of mental symptoms. Finally, she fell into the hands of a psychoanalyst of the Freudian type. To him she unfolded a pitiful tale of family complications, psychic shocks, repressed complexes, and mental conflicts, all of which she manufactured to suit the occasion. Later she confessed to a member of her family that she did this because the physician seemed to expect it of her and because it made him take an added interest in her.

Manic-Depressive Insanity.—In a great many cases, dipsomania, or periodic drinking, is a symptom of manic-depressive insanity, the manifestations of which are obscured by alcohol. The patient drinks to combat the restlessness and sleeplessness of an oncoming excitement or the retardation and inhibition of a depression. A case of this kind came under my notice at the Government Hospital for the Insane at Washington, D. C. A very efficient army officer had, for years, been in the habit of going on a prolonged alcoholic debauch once or twice a year. Reprimand, punishment and treatment had all been found unavailing. Finally, he had a frank outbreak of manic-depressive excitement, with recurrences. Several noted writers who were afflicted with manic-depressive insanity have described graphically the effect of alcohol and drugs upon their disordered minds. De Quincey used opium intermittently from the age of eighteen. During his depressions, he could write only with a bottle of laudanum on his desk. He described its effect as follows: "Opium introduces into the faculties the most exquisite order, regulation and harmony." It purifies the moral affections, elevates the imagination and gives a larger scope to it." Writing of his depressions to a friend, he states that everyone consulted ascribed them to the use of opium. "But," he adds, "this seems improbable for more reasons than one. First, because previous to any considerable use of opium, namely in 1812, I suffered from an unaccountable attack of nervous horror which lasted for five months and went off in one night."

Robert Burns frequently spoke of finding relief from melancholy in alcohol, Edgar Allan Poe (9), writing to a friend, said, "I become insane with long intervals of horrible insanity. During these fits of absolute unconsciousness, I drink. God knows how often or how much. As a matter of fact, my enemies refer the insanity to the drink rather than the drink to insanity."

Dementia Praecox.—Alcoholism is not infrequently one of the first symptoms of dementia praecox. Major L. L. Smith (10), Medical Corps, U. S. Army, investigated a series of 59 cases of dementia praecox at the Government Hospital for the Insane. He found that 36.6 per cent. had a history of excessive alcoholism. Ten per cent. had been regarded as cases of alcoholic psychoses on admission.

Epilepsy.—Kraepelin (11) affirms that dipsomania is allied to epileptic phenomena. My experience has not confirmed this view although such cases doubtless exist.

Organic Brain Disease.—Excessive use of stimulants is very frequently one of the first symptoms of arteriosclerosis, senility, general paresis, cerebral syphilis and multiple sclerosis. One patient who came to the clinic at the University of California gave a history of six years of excessive alcoholism. A tentative diagnosis of alcoholic pseudo-paresis was later changed to multiple sclerosis. Post-traumatc alcoholism frequently follows severe head injury.

Cure.—The literature on the cure of alcoholism is as voluminous and varied as that on other phases of the subject. Cures have been effected in all manner of ways, by religion, hypnotism, psychotherapy and drug therapy. All of these methods, however, have failed of a universal cure. Probably the only sure cure was that devised by the ancient Roman, Romulus, who authorized husbands to kill their wives for drinking wine. The variety of causes of chronic alcoholism would indicate that the treatment must be equally varied. There is no "rule-of-thumb" cure. Each individual case constitutes an individual problem which requires individual solution.

Prevention.—The carrying out of eugenic measures in California and elsewhere is a move in the right direction. The sterilization of the insane, feeble-minded, epileptic, chronic alcoholic and criminal will have its effect on the next generation. Prohibition in various parts of the world is also helping solve the problem. James B. Angell, former American Minister to China, stated that he did not see two drunken Chinamen in a year. Education is also a factor not to be overlooked. The change of sentiment which is gradually taking place in regard to drinking is significant. Drunkenness is no longer considered respectable nor is it considered funny.

Treatment.—While eugenics and prohibition will help to solve the problem for the future, they do not help the present situation very much. Education, which in the minds of theorists is the solution of the problem, helps but little when it comes to actual practice. This was forcibly illustrated to me by a list of names furnished by a private sanitarium for the treatment of alcoholism and drug addiction. Of 50 persons who had taken the treatment, 11 (22 per cent.) were doctors. Education fails because no one starts in drinking with the idea of being a chronic alcoholic. The habit is formed gradually, inadvertently and insidiously. Walsh (12) cites a case of a boy whose father died a drunkard. The boy was educated and warned in regard to the dangers of alcoholism constantly and unceasingly, until he finally began drinking out of sheer curiosity and was an alcoholic for years.

Routine treatment of alcoholism by drugs is irrational. To attempt to cure the craving for one drug by substituting another and adding to the toxemia of alcoholism that of a drug toxemia is unreasonable. The cures which have been ascribed to this method are doubtless due to the improvement of the physical condition which occurs after the so-called cure is effected, and to suggestion.

The first step in the treatment of all cases of alcoholism is elimination by cathartics, diuretics and hydrotherapy. During this period drugs, hypnotics, sedatives and stimulants have to be used as indicated by the condition of the patient. Partridge (13) found that when alcohol had been cut off for ten to twenty days all craving for drink ceased. After elimination is completed and the physical health restored as far as possible, the remaining treatment is individual and psychic. In order to treat a case intelligently, it is necessary to consider the ancestry, prenatal and developmental influences, environment, illnesses, injuries, social, sexual, religious and mental life; also to make a complete mental and physical examination of the patient. In order to effect a cure hypnotism, religion, psychotherapy, re-education and introduction of new interests have all been used with a degree of success. The environment can occasionally be made more favorable by social service work.

After everything possible has been done, there remains a large percentage who, on account of feeble-mindedness, dementia and other mental conditions may be considered incurable. Reports of institutions for inebriates differ as to the number of cures effected. These range from 20 to 40 per cent. Dr. Branthwait estimates that 97 to 98 per cent. of the persons in England who become habitual drunkards eventually become more or less permanent inmates of workhouses, prisons or hospitals for the insane. At the present time, the chronic alcoholic in California spends his time in the following manner. He is arrested for drunkenness, examined, committed to the state hospital. After a few months he returns home, becomes drunk and disorderly, is again arrested, examined and committed to the state hospital. Numerous cases have been committed four or five times. The expense of his arrest, examination, transportation and detention makes him a very expensive individual to the state.

Institutional Care.—A hospital for inebriates where early cases may be treated and, if possible, cured, and the incurable cases detained indefinitely, is an absolute necessity. The chronic alcoholic is a menace to himself and the community, and must be cared for. The plan of caring for inebriates in Massachusetts is probably the most complete of any in the United States. It is outlined by Dr. Neff (14) as follows:

1. *A State Hospital for Inebriates on the Colony Plan.*
    (a) A colony for incipient or hopeful cases.
    (b) A colony for more advanced cases—men in need of custodial care.
    (c) A colony for refractory males who require more or less restraint.
    (d) A colony for inebriate women.
2. *An Out-Patient Department.*
3. *A Detention Hospital in Each City.*
    (a) For the treatment of acute alcoholism.
    (b) To act as a receiving ward for the state hospital for inebriates.
    (c) As a clinic for incipient cases.
    (d) As a headquarters for out-patient department of the main hospital.
    (e) To provide medical officers to visit prisons and to decide as to the fitness of cases for admission to the state hospital for inebriates.

In a state hospital for inebriates, cases should be under the care of physicians who have had training in nervous and mental diseases. Patients should not be committed for a definite period by a judge who knows nothing about their mental condition. They should be given an indeterminate sentence, and the length of time they are detained should be left to the superintendent. There should be opportunities for agricultural and industrial training and after the initial cost of establishment, the institution should be entirely self-supporting. A graduated system of paroles should be used and an after-care worker should follow up each case.

Conclusions.

1. Chronic alcoholism is a problem of tremendous importance medically, socially and economically.

2. The treatment of chronic alcoholism in state hospitals for the insane and by jail sentences is useless and, in many cases, harmful.

3. The causes of alcoholism are defective heredity, bad environment, pernicious

social influences, physical disorders and diseases, feeblemindedness, and mental peculiarities, disorders and diseases.

4. Cures have been effected in a variety of ways, but no method has proven universally successful.

5. Eugenics, prohibition and education are all helpful factors in prophylaxis.

6. Treatment is elimination of the toxemia resulting from the prolonged use of alcohol, with symptomatic treatment suited to individual cases. Thorough investigation in regard to family and personal history, with complete physical and mental examination of each individual case. Psychotherapy, ergotherapy and re-education are all useful in effecting cures.

7. A large percentage of cases are incurable and require institutional care for an indefinite period.

8. A state hospital for inebriates is an urgent necessity. To this the chronic alcoholics should be committed with an indeterminate sentence. They should be placed under the care of psychiatrists, should be compelled to work and paroled or discharged in the care of an out-patient department at the discretion of the superintendent.

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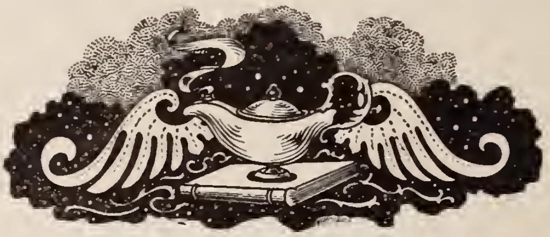

MENTAL AND PHYSICAL HYGIENE OF CHILDREN.

By

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WE WILL consider mental hygiene in the broad sense of regulation of environmental influences with the direct object of the preservation of mental health, or the prevention of mental and nervous disease. Mental and physical health are so intimately related that any consideration which neglects to include general hygiene fails to grasp the subject in its entirety. Again, it is impossible to discuss separately mental hygiene and education. Education, according to the new Standard Dictionary, is "the systematic development and cultivation of the normal powers of intellect, feeling and conduct, so as to render them efficient in some particular form of living, or for life in general." In further explanation, is stated: "It includes not only the narrow conception of instruction, to which it was formerly limited, but embraces all forms of human experience, owing to the recognition of the fact that every stimulus with its corresponding reaction has a definite effect upon character." From this definition it would seem that mental hygiene and education are synonymous terms.

Nervous stability in modern life is the exception rather than the rule. Ernest Jones, a well-known Canadian alienist, has stated that neuroses, that is nervous diseases, constitute, perhaps, the most widely-spread form of disease, that persons quite unaffected in this way certainly form the minority of the general population.

Much unhappiness and misery, loss of social efficiency and crime, as well as minor antisocial conditions, as eccentricity, faddism, crankism, are preventable and the prevention to a large extent rests with those who have supervision of the individual during his early life, particularly parents and teachers. The ignorance of many of these regarding child hygiene, particularly as relating to training, mental discipline and character formation is appalling. This would seem to be a legitimate field for advice on the part of the family physician, but the opportunity, even when given, is most often neglected, though there is no more important phase of preventive medicine.

The old trite proverb to the effect that it is useless to lock the barn after the horse has been stolen is particularly applicable in nervous and mental conditions. The time for the application of mental hygiene is in childhood, when the material to be molded is still soft and pliable, while habit may be made servant rather than master.

It has been said that the education of the child should begin with the grandparents. This is, to an extent, true, for the forces of heredity, though obscure, must be reckoned with. Certain varieties of behavior, as reflex activities and instincts, either exist at birth or arise later independent of experience. Colvin says: "No form of behavior is absolutely created by the environment. Education does not bring into existence something out of nothing. Education modifies what is already present in some degree; it selects and preserves certain modes of expression, eliminates others, and again recombines into new complexes the elements of behavior found in still other relations. If the organism does not possess at birth definite means of reacting to its environment, it would soon perish in the struggle for existence. It never could be educated." We must not be too hasty, however, to attribute to heredity faulty modes of reaction without first taking into consideration the environmental forces of example. Traits and characteristics may re-occur in children and grandchildren, or even more remote descendants, and still not be due to heredity. Lack of emotional control may be passed on from generation to generation simply because it has become the usual and accepted mode of reaction to situations of stress, and because the deterrent effects of discipline, education and proper hygiene have never been properly utilized. In some families it would seem that faulty feeling tones of discouragement, pessimism, and discord are imbibed with the mother's milk. What chance have impressionable children for normal development under such circumstances? Heredity is made the scape-goat for faults and conditions which would admit of easy correction were it not for the indolence, indifference and irresponsibility of parents and others. Johnny may have his grandfather's quick temper, but does his father encourage self-control? Jane may be as unstable emotionally as her grandmother, but does her mother show her how to meet occasions of stress with reasonable fortitude and overcome childish outbursts with calm understanding and forbearance? That many disorders of environmental reaction are due rather to faulty example and defects of training than to purely hereditary causes is shown by the distinct changes in character with relief from nervous symptoms following psychotherapy and re-educative measures of various kinds. A Hungarian physician, Dr. Dèci, as the last of ten rules which he suggests for checking the development of mental degeneration, places removal of all children born of nervous or neurotic parents from the influence of the parents, and from all home associations as soon as possible.

Dr. L. Pierce Clark, of New York, believes that the majority of nervous affections have their origin in those individuals possessing illy organized physical and mental habits.

We must, however, not ignore the fact, as apparently do many psychologists, even those with medical training that developmental hypoplasia, or, in plainer language, faulty physical make-up, is the foundation upon which the superstructure of psychic mal-adjustment is reared. The neuropathic constitution is not a figment of the imagination. Hence the more need for a broad conception of mental hygiene; a conception sufficiently broad to embrace every agency and measure that can be utilized to contribute to the well-being of the individual.

While a matter of considerable difficulty to begin the education of a child with the grandparents, it is possible to begin with the parents, and it should be within the province of the physician to advise prospective mothers and fathers how to so modify their own habits of conduct as to best conserve the interests of their offspring. Eugenics, while an interesting and in many ways useful study, is not and will likely never be an exact science, as some propagandists would have us believe.

Toward the end of 1913, Prof. Karl Pearson of the Francis Galton Laboratory of Eugenics in the University of London, became very much agitated about the popular conception of the scope of this subject and, as is usual with agitated Englishmen, wrote a letter to the *London Times* which was abstracted in the *Journal of the American Medical Association.* Prof. Pearson regards the current attitude of public opinion as at once disheartening and exasperating. The founder of the science, Sir Francis Galton, thought that progress toward increased race sufficiency could be made by two routes: (1) by the scientific study of heredity and environment as they bore on racial development, and (2) by a popular movement emphasizing the importance of these factors in national welfare, and the urging of their proper appreciation by legislators and social reformers. Pearson states that several of those who were working on the subject differed from Galton as to the relative urgency of the two routes, seeing the danger that before the lines of the science were firmly drawn and substantial foundations laid the whole subject would be made ridiculous by the efforts of an uninstructed press to tickle the taste of a jaded public. This fear has been realized for the press now treats us to "eugenic" marriages, to "eugenic" babies, and to "eugenic" plays which have nothing whatever to do with the problem of race betterment. Eugenics, Pearson states, is rapidly developing into a topic for the poseur, the Kongressbummler and the paragraphist. Even eugenic publications and eugenic congresses are issuing statements in regard to such vitally important topics as insanity, mental defect or the influence of heredity and environment which are obviously or demonstrably incorrect. Our knowledge on these subjects is not yet nearly adequate. Years of patient work in medico-social observation, in genetic experiment and in careful study of family history, are needed before the laws of eugenics as a science can be dogmatically stated. When, in the name of eugenics, such dogmas are proclaimed as "at last it is possible to give definite advice to those about to marry or who do not wish to transmit their undesirable traits" or "weakness in any trait should marry strength in that trait, and strength may marry weakness," we stand aghast at the evil worked by the rapid popularization of "eugenics" and recognize the fact that a movement thus careless of its facts and vaunting in its conclusions must collapse.

While admitting that it is unwise, and worse, for the epileptic, the feeble-minded and the insane to beget children, to insist upon an absolutely clean family history as a condition for license to marry would mean a nation of celibates, or perjurers, and of profligates. Like the Irishman's camel, "There ain't no such animal." In this connection I am reminded of the *nouveau riche* who gleefully detailed to a friend the large sums he was expending to have a geneologist search out his family tree. Some time later the friend inquired how the search was progressing. "Sh!" said the rich man, "I'm paying hush money now." So far "eugenic marriages" and "eugenic babies" have shown no superiority over the old-fashioned kind. In one instance, it is said, the expected "Superman" turned out to be a girl. A reasonably healthy man or woman living under normal hygienic conditions with fairly clean family records, stand a pretty fair chance of having children mentally and physically healthy, provided they receive the proper care during the entire period of development.

It is the custom to estimate the age of the individual from the time of his birth, when he begins a separate independent existence. He is, however, capable of being influenced by environmental conditions from the earliest moment of conception. The great difficulty in determining whether causes be purly hereditary or environmental lies in this fact, and ignorance of this fact is the reason for much unmerited blame being placed at the door of heredity, especially by those agitators whom a little knowledge has made dangerous.

Of the environmental causes capable of exerting their influence early in the life of the individual, alcohol may be taken as an example. Stockard bred, in various combinations, animals whose ancestors were exposed to long periods of intoxication from the inhalation of alcohol fumes. He found that the results of matings of apparently normal animals of alcoholic parentage deteriorate in a marked degree with each successive generation. There was a relative increase in the still-born litters, an increase in the death rate of the living young and an increase of animals with congenital defects of the eyes in the third generation as against the second. Studies on the part of many other well qualified observers tend strongly to prove that alcoholism even of mild degree in the parents, especially at the time of conception, has a markedly deleterious effect upon the offspring. (A very potent argument against vinous bachelor and wedding suppers; and in fact against tippling at any time during the marital state.) Although there are some scientists, as Professor Karl Pearson and his associates, who hold that alcoholism *per se* does not result in deterioration of the physical and mental powers of the offspring, others possessing the advantage of long clinical experience continue to hold the opposite view. Dr. Hyslop, for instance, in his presidential address to the Society for the Study of Inebriety, very conservatively states that there is evidence supported by experiments on animals (such as those mentioned), that alcoholism tends to increase the number of births, but to render the offspring weaker. Epilepsy, mental weakness, insanity, deafmutism, stunted growth, and other states are apt to be not only intensified, but make their appearance at an earlier age when parental alcoholism is a factor. It accentuates the downward trend of psychoneuroses, and with each successive generation the offspring become alcohlic or degenerate at a relatively earlier age. In families prone to degeneracy, alcohol appears to Dr. Hyslop to put the finishing touches. It sets alight the existence of nervous and mental diseases which might be on the wane, and renders the offspring more liable to the transmission of the degeneracy not only in parental intensity, but in manifestation at an earlier age.

After conception the environment of the mother becomes that of the developing child. Diseased states of all kinds have a vitiating effect upon cell development. It is thus the duty of the expectant mother to prevent contagion by avoiding contact with illness of any form. Again, certain unhealthy habitual states of mind, as depressive or disruptive emotions and feelings, apprehensions, fear of disease and fixed beliefs in fictitious disease, illogical doubts, scruples and anxieties; habits of thought; such as constant introspection, concentration of the attention on the physiological functions of the body, etc., bring about disorder in function of various organs. The possible effect upon the child of derangement of bodily function should be sufficient to cause the mother to adhere strictly to a régime assuring an existence free from emotional turmoil, by controlling her anxieties, moods and other faulty habits of thought. Equilibrium is with difficulty attained when the co-operation of the husband and other members of the family is lacking. Pity and extravagant sympathy are harmful, but tactful consideration and understanding will do much toward making the period of pregnancy one of comfort and joyful anticipation. The *bête noir* of expectant mothers, by no means limited to the ignorant, is the supposed influence of maternal impressions. Many women pass miserable hours fearing their child will be "marked" or deformed because of some pernicious sight, dream or thought. The public should be instructed that maternal impressions have no scientific basis and belong entirely in the category of "old wives' tales." Monstrosities and other defects of development are relatively common and fall into definite, natural and simple classifications. Coincidence may be multiplied, but direct scientific proof is lacking. The only danger to the child lies in the modification of maternal bodily functions engendered by the fear itself. In an article of unique interest entitled "The Bringing Up of the Child in England in the Seventeenth Century," published in *The Child* (England), Professor Foster Watson makes liberal quotation from an extremely rare volume upon mother and babe, consisting of prayers, meditations and songs, and written for the use of his wife by William Herbert and published in 1648. In discussing the troubling problem, if the mother has met a hare, lest the child have a hare's lip, Herbert says, "What virtue hath this little heartless creature to make a child's lip like her own." She (poor wretch) goes along, either to feed soberly, or lie in her cold form, or perhaps save her life from a pack of greedy hounds. Harm she thinks none, or can do none, but in eating the corn or grass. How come then our hare-lipped ones, but by the strong conceits of their fearful and superstitious mothers. Then follows a prayer for the mother to use beginning, "Lord, let never my mind to possessed with such strange opinions." Herbert in a superstitious age evinces plain common sense often lacking even at the present date. It is said that Greek women of ancient times in order to ensure cheerful impressions had their apartments filled with beautiful statues, paintings, and tapestries, and that this was one cause of the physical beauty of the race. Werber experimented along lines somewhat similar to those followed by Stockard in studying the influence of alcohol. He subjected the fertilized eggs of a variety of fish to certain substances resulting from disturbances of human metabolism. The result was the production of monstrosities of various types. A suggestion is made, based on these findings, that many of the monstrosities in nature and congenital defects of sense organs and nervous system as well, are the products of a disturbed metabolism. These defects may not be apparent to the eye but may consist in slight chemical alterations, the effects of which may be latent until some advanced period of life. Thus, many instances of supposed inherited disease may eventually prove to be the result of improper functionating of the maternal organism—environment again. The athlete preparing for a contest of strength or skill subjects himself to a rigid course of training and discipline in order to bring each of his physical (and mental as well) powers to its highest state of efficiency. Not only are his hours of sleep, his diet, and his baths systematically regulated, but he must often by sheer will power force himself through long hours of monotonous and often irksome exercise and abstain from all self indulgence that might in any way interfere with perfect equilibrium. All this that nerve, muscle, sinew and bone may be supplied with fresh, pure, invigorating blood. How often does the prospective mother, upon whose physical mechanism so tremendous responsibility rests, use equal care in preparing for her contest? The period of labor should be approached with courage and fortitude, as an ordeal it is true, but one which has been safely passed by other millions of women, by many cheerfully. It is wonderful how utterly forgotten is the suffering when the new-born babe is placed in the mother's arms. It is natural that there should be a desire to escape pain at this time. But when such escape is purchased at the possible risk of permanent injury to her child, this desire becomes not only selfish, but little short of criminal. Narcosis of the mother through powerful drugs cannot but affect the organism which is still supplied through her blood. Risk to the child does not terminate with birth, as morphine and similar drugs are excreted in the mother's milk for some time after their administration, with resulting danger of damage to the delicate nervous system. Wholey, whose experience in the treatment of drug addictions has been large, has noted that if a woman taking morphine in large amounts bears a child, the child is apt to be seriously dependent upon the immediate continuance of the drug. Having obtained it through the mother's blood, he must now have it to prevent death from heart collapse. "Twilight sleep" and other forms of narcosis so broadly exploited by certain lay magazines is not justifiable upon any ground in the labor of normally constituted women. When conditions are abnormal it is for the obstetrician to decide.

Bottle-fed babies, result from stress of social life, cosmetic reasons, imagined inability, lack of sustained effort and, in a very few instances, genuine inability to nurse. J. Madison Taylor, of Philadelphia, says, "The chief enemies to breast feeding are social demands, fashion and accommodating physicians." Still believes that convulsions are much commoner in hand-fed infants, and I have myself noted the frequency of bottle feeding in children giving other evidences of nervous instability. Another physician states, "The young mother should be told that it is her sacred duty to nurse the child, and the physician should exert all his energies in assisting her to this end and he should protest with equal energy against the not uncommon inclination to avoid this duty for social or supposed aesthetic reasons."

Under normal conditions the new-born infant spends the greater number of his hours in sleep. He is quickly tired by the unwonted stimulation of his sense-organs, awakening from time to time in response to various stimuli, as hunger and pain, he quickly falls into repose as soon as the disturbing influence is removed. The first few months is an important period in regard to future nervous and mental stability. Undue stimualtion through rapidly succeeding sensory impressions cannot but lead to exhaustion of nerve cells with far-reaching harmful effects. Though sensation is the basis of all mentality, the various sensory stimuli should follow one another in orderly succession rather than in a heterogeneous jumble. I am not of those who hold that the infant should lead a purely vegetative existence, with attention only sufficient to ensure bodily growth. Motherhood, and for that matter, fatherhood too, is entitled to some enjoyment of the wonderful new being for whose existence they are responsible. It is small wonder that some mothers delegate the care of their babies to paid employes if such care is to be limited to the absolutely necessary natural needs. Loud noises, brilliant lights, rapid movements, rocking, dangling, tickling, etc., should be avoided, but it is carrying the Spartan idea too far to deprive the parents of all fondling and caressing. The indissolubility of maternal caresses and the idea of motherhood is shown in most pictorial representations of this relation and in the best known Madonnas. May not the human Christ touch have come through the human Mother touch of His early years?

The automobile, the street car and train, the moving picture show, the phonograph and pianola, the high power electric light and many other conveniences and tribulations of urban civilization have their influences in over-stimulating and exhausting the delicate nervous system of the young child, and the frequency with which children, even of parents who should know better, are exposed is surprising. It is small wonder that we are a race of neurotics. Early over-stimulation leads to precocity, and precocity to early deterioration. On the other hand, careful and well-directed application of sensory stimuli during infancy and early childhood is a powerful aid to natural development. Sensory training cannot be too early begun, but must be adapted to the delicate nervous mechanism of the individual and never must it interfere with sleep or rest periods, or be carried to the point of exhaustion. Crile has shown that exhaustion from any cause may lead to impairment and actual destruction of brain cells. Some of you likely had the privilege of seeing the photographs of microscopic preparations illustrating this point which have been shown by Dr. Crile.

The fond mother instinctively uses simple methods of sensory training when she clasps the infant to her breast, affording him the sensations of warmth, softness and pressure; when she inserts her finger into his palm to be clasped by the tiny fingers, a reflex act that early makes its appearance; and when she dangles a rattle or shining object before his eyes; aiding in the establishment of co-ordinate movements.

Early infancy is not too early to begin the inculcation of orderly habits of thought and action, of utmost importance in character formation. Habit is not dependent upon intelligence, and in some forms may be instituted early in the mental life. Feeding at regular intervals, followed by regular periods of sleep should be established in the first few weeks. The infant, from birth, should be accustomed to being placed in his crib while awake and to go to sleep without rocking or other aid. Training to proper control of the natural functions may be accomplished by intelligent effort surprisingly early. Too much cannot be said in depreciation of the use of the rubber pacifier and the habit of thumb-sucking. Infection by disease germs and interference with the development of the bones of the face and jaws are not the only dangers which result from these habits. Not only do they absorb the attention to the exclusion of other sensory impressions, thus retarding mental development, but they have a sexual significance as well. Regular habits established in infancy should be carried through childhood into adolescence and youth, with modifications suitable to varying ages and conditions. Bathing, like other measures belonging categorically in the domain of physical hygiene, may be made an important phase of mental hygiene. The psychical effect of a sense of physical cleanliness is evident to all; but there are other important advantages in regular bathing. The pride of the proverbial Englishman in his morning "tub" is not without foundation. It takes courage to jump out of a warm bed and subject one's body to an icy spray or plunge. It is the requirement of this very element of courage that renders it so useful. The cold bath tends to engender a feeling of confidence, of power and self reliance, distinct from its effects of stimulation of metabolism, nerve tone and excretion. The daily shower may be initiated as early as eighteen months. A word of caution is necessary, as it is not advisable to suddenly introduce a delicate, enervated child to the rigor of the cold shower. He should be first prepared by a course of rubbing and sponging.

Regular open air exercise, begun in infancy by keeping the child out of doors as much as possible during both waking and sleeping periods, should be continued, even at some sacrifice of conventional indoor occupations and activities. A love of open places, of fresh air, and the phenomena of nature will be fostered which will go far toward maintaining mental equilibrium later in life. Open-air sleeping, though considered an uncomfortable fad by those whose horizon is bounded by four walls, is a powerful aid in establishing and maintaining mental balance. Fear of the dark, of thunder and lightning, and of being alone tends to disappear when a day of healthful activity is followed by a night in the open under the stars. If the fundamental primitive fear instinct alone, as Boris Sidis believes, is the source of all mental disorders, it should be the first aim of mental hygiene to cultivate those traits of character which lead to its subjection and this cultivation should, as I have attempted to urge throughout these remarks, begin as soon as the child is capable of receiving any than the simplest impressions. The courageous child does not lie; and if a child be truthful it matters not what other faults he may have. Moral courage might sometimes be called psychic courage or the faculty of facing one's own thoughts without flinching. This, the mentally unstable are seldom able to do and hence the "yellow streak" which we so often dispise when we should condone.

Among the bad habits early acquired by children is that of fancied aversion to particular articles of food. This may have occurred through over-indulgence, through unpleasant sensory impressions upon an untrained taste, or merely through imitation of an older individual. Adults should early learn to place a curb upon their tongues and actions in the presence of children and should never for an instant forget that they are the models upon which lives are being patterned. I have seen a hungry child allow his plate to go untouched for no other reason than that an older member of the household had done the same at a previous meal; and refuse articles for which he had a real fondness, because a guest the day before did not "like them." I have made it a rule at Wildwood Hall that no member of the household shall voice a dislike of any article of food, or shall refuse it when offered. Eating of it is not compulsory, it may be picked at a bit and allowed to remain on the plate, but without comment. The statement of the child that she doesn't like this or that is met by "O, here everyone eats some of everything put before one." It usually is not long before the despised dishes are among those most relished.

In the development of normal mental life, much depends upon the early recognition of the value of pleasant and unpleasant feeling tones. It is the affective consciousness (feeling) that gives value to experience. To pure intelligence the object of knowledge is cold and colorless. "On the other hand, feeling gives a *warmth* and *glow* to experience; it reveals a world filled with *worth* and pulsating with human *values.* In normal experience these two aspects of consciousness are properly balanced. Our feelings do not completely dominate us, neither are we indifferent to the changing experiences that surround us. In abnormal states, however, this balance is no longer preserved." Simple feelings may lie anywhere between pleasantness and unpleasantness and are prominent factors in the more complex states of consciousness known as emotions. As a part of emotional experience arise sensations from changes in various bodily functions, as respiration, circulation, elimination, etc. An emotion that has run its course often passes over into a permanent passive attitude termed a mood. This mood may become the path of least resistance for further emotional upheavals. An inborn tendency similar to the mood in its manifestations is the temperament. Mental hygiene should aim at the development of strong pleasant feeling tones in connection with activities and duties which make for improvement. Williams states, "the essence of psycho-prophylaxis (that is, the prevention of mental disorder), as of psychotherapy and education, is to associate useful activities with agreeable feeling tones, and to disassociate from useless or injurious acts the agreeable feeling tones that may have been acquired." The activity itself is not of necessity one which gives pleasure to the individual; in fact it may have connected with it strong tones of decidedly unpleasant nature. Thus, certain sorts of work may be irksome and unpleasant at first, but are persisted in because the results are of benefit to the individual, until later the work itself gives pleasure through the expression of normal self-activity. The cold shower may be approached with premonitory cold shivers, the result of an unpleasant feeling tone derived from previous experience of the momentary shock, but pleasant feeling tones arising through memories of the sense of exhilaration and well-being after the rub-down, assume the dominance and serve to carry the individual through the ordeal with fortitude.

There is a natural tendency for pleasant feeling tones to strongly associate themselves with activities and modes of conduct habitually and repeatedly performed, and for disagreeable feeling tones to lose their potency. Disobedience of parental admonition when first practiced is accompanied by strong emotional disturbance, fear of detection, dread of punishment, remorse, shame, etc. With repetition of the act, however, the emotional accompaniment becomes less troublesome, and the agreeable feeling tone, for the experience of which the act was first undertaken, assumes its place. To reinstate obedience it is necessary to surround the disobedient act with unpleasurable feeling tones. Corporal punishment is but rarely of value; usually doing more harm than good, especially when administered by an angry parent or teacher who unconsciously acknowledges his own insufficiency by resorting to this means the real purpose of which is to act as an outlet for the uncontrolled emotion of the adult. In the child it engenders fear, loss of respect and affection, and a feeling of resentment which may persist into later life, marring for all time the confidential relationship which should exist between parent and child. In most breaches of good behavior deprivation of some pleasure eagerly desired or enforced solitude will be found efficacious. In older boys, constitutionally defective in ethical sense, or whose ethical sense has developed awry by reason of faulty early training, a resort to physical force may sometimes be necessary but never in the form of flogging. Ancient chivalry was founded upon some excellent principles, one of which was the individual's personal responsibility to the injured person or to a self-nominated champion; but always with opportunity for self-defense. A method I have successfully used, is to first explain to the boy that he has been guilty of an act which of necessity affects another person or group of persons and that as he goes through life he will in such situations find there is someone ready to take the part of the injured one. He is then told that he and I will put on boxing gloves and fight until he has been punished sufficiently to impress that fact upon his mind. If the boy has any manhood in him, he puts up the best defense of which he is capable, takes his punishment without complaint, acknowledges his fault and promises to guard against a repetition. If he loses his temper the punishment is made more severe until he comes to realize that to lose self-control is to add weakness to weakness. Especially at the period of adolescence does respect for physical superiority outweigh precept. This alone, if there were no other reason, is a potent argument for male teachers at this time.

This talk has already assumed such length as to preclude any but brief consideration of two most important phases of hygiene, *i. e.*, formal education and sex hygiene. In regard to formal education: I merely wish to make the assertion that modern educational measures tend to lose sight of fundamental individual variations in temperament, in ability and in ultimate purpose. There is over-emphasis of stereotyped measures perhaps suitable to the average child, but not to the one varying from the average in physique or in capabilities. Mere memory is made all-important, while the reasoning faculties are largely allowed to lie dormant. The curriculum is overcrowded, the time allowed for wholesome physical and mental rest, too little. Teachers and schol authorities have too little knowledge of child hygiene in general, and mental hygiene in particular.

Sex hygiene has become a veritable hysteria of agitation, with a morbid emphasis upon the manifestations of abnormal sex psychology and venereal disease. The only real interest of many exploiters of sex hygiene is a morbid one, while others, honest in purpose and well meaning, because of celibacy, temperamental incapacity or unreasonable prejudice, have warped and twisted conceptions regarding the sexaul impulse.

By the process of projection "prudery detects wrong where no wrong is" and under the guise of intellectuality, sociology or modernism allows thoughts regarding sexual matters to enter consciousness under proper chaperonage, as it were, permitting frank and open discussion of matters, which by all canons of good breeding and good taste would be taboo. As Experience in the play of that name states: "What with Eugenics in the parlor and Sex Hygiene in the public schools, Innocence has fled to the woods."

These remarks are not directed against nor are they meant to discourage those who in a truly scientific and humanitarian manner are seeking the truth regarding sexual immorality in the young, but rather against those propagandists who insist upon their instruction in matters the full significance of which is beyond their understanding. I am strongly of the opinion that sexuality in all its forms should remain, in so far as is possible, a closed book to all children until the age of puberty at least, and that even at that period whatever simple instruction is necessary should be given by the parents and by no one else. They should be familiar with the sexual significance of apparently trivial and innocent manifestations, the importance to the individual and to society of a well balanced, even if strong, sexual nature, and should be taught to detect early aberrant impulses and tendencies. Though we may fail to subscribe in their entirety to the views of Freud and others regarding the sexual significance of infantile and childish proclivities, an understanding of the basis of his arguments cannot but lead to an acknowledgment of their force, in some particulars at least. Premature eroticism most often has its origin in causes controllable by the parents and community and proper control would eliminate the need for early formal instruction in such matters.

If the energy which is now going to waste, if not doing actual damage in clammering for the instruction of the young in these subjects, were utilized in removing pernicious sources of instruction more good might be accomplished. As you come down town glance at the billboards of the theater, look at the posters in front of the movies; examine the exhibits in the drug store windows; notice the display of lingerie upon models startlingly life-like in the shop window, and then consider whether you are giving the boy, yes, and the girl, too, a square deal. If this does not convince you that your energies may be better directed, examine closely the books and magazines your children are reading, consider critically some of the plays they see, even some that you yourselves take them to, with their sensual appeal, scanty attire, verbal implication and innuendo.

I have attempted to show that mental hygiene is not a mere metaphysical abstraction capable of practice only by the chosen few, but that it is reducible to the terms of common every-day life that in its application every individual and event making up the environment of the child, exerts an influence for present and future good or evil.

Mental and Physical Hygiene thus takes its place as a most important phase of the broad subject of Euthenics. Euthenics, as you know, is the "science and art of improving the human race by securing the best external influences and environmental conditions for the physical, mental, and moral development of the individual, and for the maintenance of his health and vigor."

Among the social agencies aiding in the practice of the modern art of euthenics may be mentioned the public schools, play-grounds, juvenile courts, open-air schools, public baths, school lunches, kindergartens, children's hospitals and dispensaries, milk stations, fresh-air farms, etc. All of these are striving directly or indirectly for future race betterment through the cultivation of the individual.

THE NATURAL INSTINCTS IN RELATION TO DISEASE AND PSYCHOSES.

By

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TWO intense desires rule and govern mankind, control all man's thoughts and sorrows. They are the two appetites the human being is endowed with, the hunger for food and the craving for love.

Curiously enough, while men take great pains in the education of the young to prepare them for the gratification of hunger, the much tabooed question of sex has been excluded, in our present civilization, from every discussion.

Yet love lies at the foundation of society, it permeates, unconsciously, the thoughts, aspirations and welfare of mankind. Love is glorified as the source of the most admirable productions of art, of the sublime creations of poetry, and music; it is accepted as the mightiest factor in human civilization, as the basis of the family and of the State.

We all know the power of love and the egoism of passion, absorbing all other considerations.

Virgil calls love the greatest conqueror.

Solomon sings, "Love is strong as death."

When man was made in the image of God, that is, when he was given a divine intelligence, a faculty and privilege accorded no other of His created beings, it was that he might have dominion over and subdue the earth, that there might be, in His great creation, an actual, visible, tangible power to curb and control all natural, physical impulses, not only in mankind himself but in all other life, both of the vegetable and animal kingdoms. But this divine intelligence or attribute, peculiar only to any man, did not in any sense take away from man the natural instincts, common to other animal beings, and which are just as truly God given.

Because we see it on every hand, to the doctor it is an axiom, that the paramount natural impulse is the perpetuation of the species, transcending even the powerful impulse of self-preservation. Witness, please, the life of a salmon fish. And to you who have been on the North Pacific Coast this is so commonplace that we forget its significance. Hatched in the fresh waters of the smallest streams it finds its way into the ocean and there for three years lives with no other object in life than of finding food and protecting itself from the enemy, attaining bodily size and strength seemingly for the climax of its existence. At the proper time and season, then, the great "run" is begun. There is then no more thought of self, no more feeding, only to reach the pure headwaters, deposit spawn, perpetuate the species, and, with even no attempt at getting back to the great ocean, literally lay down and die.

A perspective of its life shows every act and movement only a part of the eternal scheme of perpetuation of the species. The three years of activity in self-preservation only preparing for the suppreme act and seeming motive of life itself.

Sexual connection among butterflies of the Bombyx family is no less marvelous. They live for months as caterpillars and sometimes for two years as chrysalids, hibernating in a cocoon in some corner of the earth or in the bark of trees.

Finally the butterfly, brilliantly colored, emerges from the cocoon and spreads its wings. It only possesses, however, a rudimentary intestinal canal for the short life which remains for it does not require much nourishment, and is only devoted to sexual connection. The female remains quiet and waits. The male, furnished with long antennae, which perceive the odor of the female at a distance, literally of miles, commences an infatuated flight through the woods and fields, as soon as its wings are sufficiently strong. His sole object is to reach the female. Here there are numerous competitors. The one who arrives first possesses the female, but expires shortly afterwards. His competitors die also, exhausted by their long flight and starvation, but without having attained their object.

After copulation, the female searches for the green plants which will insure a long life for her caterpillar offspring. There she deposits her fecundated eggs in considerable numbers and then expires in her turn like a faded flower, which, after completing the object of its existence, falls, leaving the fruit in its place.

It *is* an important question and all our various views, prejudices and dogmas, notwithstanding, we must admit that the importance of the subject demands scientific research on account of its forensic bearing and its deep influence upon the common weal.

The medical man finds out, all too often, how sad the lack of our common knowledge is in the domain of sexuality when he is called upon to express an opinion as to the responsibility of the accused whose life, liberty and honor are at stake. He then begins to appreciate the efforts that have been made to bring light into darkness.

Certain it is that so far as sexual crimes are concerned, erroneous ideas prevail, unjust decisions are given, and the law, as well as public opinion, are, *prima facia*, prejudiced against the offender.

The scientific study of the psychopathology of sexual life necessarily deals with the miseries of man and the dark side of his existence, the shadow of which contorts the sublime image of the deity into horrid caricatures, and leads astray aestheticism and morality.

It is the sad privilege of medicine, and especially psychiatry, to ever witness the weaknesses of human nature and the reverse side of life. It is from the search of truth that the exalted duties and rights of medical science emanate.

I make the appeal to myself and the medical profession to lay aside modern fetichism, to get right down to "brass tacks," and study and consider the natural instincts and impulses of human nature in the light of unprejudiced reason, and perhaps many perplexities will resolve themselves into simple, to-be-expected, effects of known causes.

In the remotest antiquity the worship of the generative principle was the only religion men knew. Sex worship was not confined to any one race, but was the form of worship common to all primeval peoples of the globe. Hindus, Chaldeans, Hebrews, Egyptians, Greeks, Romans, Gauls, Teutons, Britons, and Scandinavians, all shared in phallicism and yonism. The study of sexual activities and generation was the basis of ancient Hindu theology.

In the Old Testament are records of the remnants of sex worship among the Hebrews before the adoption of the cult of Jehovah. Instead of invoking the deity in taking a solemn oath, Abraham orders his servant to place his hand upon his phallus, because the phallus was still kept in its former high veneration. The slain enemy was, for this reason, deprived of his phallus. David bought Saul's daughter with a trophy of two hundred phalli, taken from the slain Phillistines. Circumcision also shows the incorporation of phallic ritual with religion.

In the same light and with the same veneration as the phallus was the yoni worshipped. In the yoni was worshipped the receptacle of life, the divine ark, within the hidden enclosure of which were contained the mysteries of life. Its interior was considered the holy of holies. The yoni was, therefore, often represented by an ark, which was the holiest of all symbols in the worship of the ancients. The sanctum sanctorum of Jehovah's temple harbored an ark.

The pyramids of Egypt served later on as graves for the kings, but *originally* they were erected in honor of the feminine creative deity.

With the ancients the passion of love and the fervor of religion were closely interwoven.

The lapse of Israel into the former sex worship caused a reaction, especially in the latter days of the second temple, among the faithful adherents of the religion of Jehovah. These pious men sought the greatest virtue in chastity and celibacy and looked with contempt upon sexuality. In the beginning only individual persons took to celibacy, as did Elijah, but later on they became much more numerous and formed different orders, overlooking entirely the tremendous strain upon the physical, mental and moral forces such an unnatural life must carry with it. For, though the final act, coitus, may be suppressed by the will, yet its emotions are irrepressible.

The neurotic nun who believes that she is embraced by one of the saints imagines she has subjugated the instinct of sex, but in reality her emotions have sexual origin. In the life of many saints, actions caused by great sexual excitement may be found. Augustinius, in his confessions, says, "My heart was burning, boiling and foaming with unchastity—it was poured out, it overflowed, it went up in licentiousness."

Mankind at large is surely ruled by the dictates of love in our day, no less than at the time of sex worship. One glance at the fashions will bear out this contention. Gunther says: The "demi-monde" has always, since fashions were in existence, dictated them, in Rome, in Venice, and in Paris. Being Cupid's most faithful servant, fashion selects for emphasis, those parts that will serve best as the target for the winged god's arrows, and standing, thus, exclusively in the service of love, explains its modern fickleness. In previous epochs the same mode of dress was worn for centuries, as the European peasants' dress shows. The present feverishly frequent change of fashion is a pathological phenomenon betraying the diseased eagerness for ever stronger and more original sexual stimulants.

Love being thus the chief object in the lives of a considerable part of mankind, it is surprising that we have so long withheld a sane knowledge of sex and reproduction from the people and especially from women. While our ancestors were sex worshippers, we, by a strange mental process, consider all such thoughts as shameful. So deeply, indeed, is the morbid sense of shame associated with sexual desire that most people, especially women, disavow their propensity and hide their ardor from the world. They do not recognize that normal, well ordered, amativeness is a physiological and moral virtue, while manifestations of spurious spirituality are often induced by some perversion.

Prudery only betrays impurity, is the affectation of innocence and consequently implies guilt. To the really innocent and pure all things are pure.

The zealots wish to persuade us that the population of the earth increases by the stork method, and these victims of a diseased imagination and perverted moral sense have succeeded in creating a false modesty which hinders free discussion. Even the physician, who is often called upon for advice about things pertaining to love, prudishly ignores the phases of the mightiest of human instincts, which is so intimately related to human happiness or sorrow. No other physical function has been treated with so stepmotherly a regard and scant attention as the important instinct of the perpetuation of the species. The works on physiology and gynecology are singularly silent upon the subject of this important sentiment, and the practitioner, who so often has to deal with its pathological side, looks in vain for light in his text books. Even with him there is a woeful ignorance, and he is not to blame, for he hasn't been taught, of the fundamental difference between the male and female instinct. There are thousands of divorces, and double that many unhappy lives, because of this same shameful ignorance among our people today. How many, many, do you know who would gladly exchange their pitiable plight for a bed of invalidism and pain. With healthy moral teaching this could be avoided, and with it too our jail houses, asylums, and charity organizations would be relieved of their present ever increasing burdens.

The physician stands preeminent and alone in the position to acquire and disseminate this most needful help. To him is given a most stupendous responsibility, but with it also is given the ability.

Like the butterfly above referred to, the male germinal cell is ever active. As soon as liberated it immediately begins that relentless search for the female cell, which search is only ended with the accomplishment of its purpose, or by death after failure. On the other hand, like the female butterfly, the female germinal cell is perfectly passive and waits, carried, willy-nilly, wherever the currents and epithelial flagellae dictate. With it, too, like the female butterfly, that instant its purpose is accomplished, is that marvelous change and the beginning of activity. When touched and entered by the spermatozoa instantly there is thrown about it that hardened protoplasmic wall, the vitelline membrane, which precludes the possibility of being entered by another spermatozoa and in it is started that incomprehensible phenomenon of growth and reproduction. Where the activity of the male cell ends the activity of the female cell begins. Curiously enough, this same characteristic is just as patent in the mature and complex organism of whatever species as in the single cell. The part of the male is ever to be the aggressor, the part of the female ever passive, until the mission of the male is accomplished, then the mission of the female begins, the very commencement of reproductive activity.

Even in the higher plants this same rule is equally true, for here the male cells or pollen transported by wind or insect to the pistil, reaches the egg by mechanical endosmotic attraction, which brings about conjugation.

Man represents the active element in sexual union, and in him the sexual appetite, or desire for coitus, is stronger and powerfully affects his mind, although sexual life plays a much less important part in him than in the female. The rôle of woman in the sexual act differs from that of man, not only by being passive, but also by the absence of seminal ejaculations. In a considerable number of women the sexual appetite is completely absent (but it is to be noted that such women, although absoutely cold, are great coquettes). This is more easy to understand if we reflect that the unsatiated desires of the normal woman are less inclined toward coitus than toward the assemblage of consequences of this act, which are so important for her whole life. When the sight of a certain man awakens in a woman sympathetic desires and transports, she aspires to give herself to him entirely, to receive his caresses, to be loved by him only, that he may become both the support and master of her whole life. A desire to gratify a general sensual need distributed over the whole body and not concentrated in the generative organs. If we consider the importance in the life of woman, of pregnancy, suckling, and all the maternal functions, we can understand why the mixture of her sentiments and sensations is so different from that of man. His rôle is only to inseminate, hers to nourish and rear the young. Her smaller stature and strength, together with her passive rôle, explains why she aspires to a strong male support. Nothing is more repugnant to the feminine instinct than timidity and awkwardness in man. Although not indifferent to it, bodily beauty in man plays a minor rôle in attracting women. Your own observations must necessarily bear me out in the assertion that there is a woeful ignorance among the laity and, too, in the profession of these inherent sex characteristics.

Of the pathological conditions we will consider first the general term, Impotence. Quoting from "Vecki," who has written a most able book on "Sexual Impotence," he says: "At any rate, the sexual function forms the most powerful factor in individual and in social life. It is a mighty impulse for bringing into action our most effective energies, for acquiring property, for the foundation of the home, for rousing altruistic feelings for the person of the other sex first, and, later, for one's children, and in a wider sense for the whole human family."

The Massachusetts statute concerning divorce says: "A divorce from the bond of matrimony may be decreed for, among other causes, impotency of either party." The English and German law is to the same purport.

He who has become prematurely impotent is one of the most unfortunate creatures, his misfortune being the greater as he has to be ashamed of it, must conceal it, is pitied by no one, but scorned, and, alas, not always can he hope for recovery. Vecki says, "I venture to assert that in many cases it is a better deed to restore to an impotent man the power, so precious to every individual, than to preserve a dangerously sick person from death, for in many cases death is preferable to impotence.

The energy of man, his courage, his enjoyment of work and life, all, with hardly any exception, depends on his sexual power. Let a man who has to labor and produce from early morning till evening, who must day after day begin ever anew the struggle for existence, lose that little bit of love and his pathway will indeed be a dreary one and through a vale of tears. Eunuchs and the sexually impotent differ in appearance and in conduct from their fellowmen who are in full possession of virile power. Even though executed with talent and spirit, the work of an impotent man bears the stamp of impotence. A great master once said that he was able to tell by a picture, not only whether it was painted by a young man or an old one, but also the condition of the artist's sexual powers.

The character of a man must, as a matter of course, be considerably affected by the consciousness of impotence. No one is more severe than the impotent in passing judgment on his neighbor. No one so ruthlessly or mercilessly condemns a misdeed, caused by passion, against the very wise precepts of ethics. Since he cannot join the virile in their enjoyments of life, he makes a merit of his incapacity. Perhaps you personally know some man or woman who might, with little effort, be placed in this category.

The striving of a man to found for himself a home, a family, is a stimulus to work for the accomplishment of great deeds in his sphere of life. Such a stimulus does not stir the impotent. Krafft-Ebing says, "With all the morality which love needs to rise to its true and pure character, its most vigorous root is nevertheless sexual passion." Similarly, ambition is closely dependent upon the sexual power, as it seldom makes its appearance before puberty. Let me observe that many fallen women would have continued good and faithful had their husbands not been more or less impotent. I have in mind one very forcible and very characteristic example of this very thing that came under my own personal professional observation. And this is even very much more often observed where the impotence or at least the frigidity is on the part of the wife.

Real impotence has a powerful influence, primarily over the mind, and secondarily over the state of health of the entire body. It is conceivable and a fact that a person who is dull or mournful and always ill humored, who is plagued with a bad thought, must by degress lose appetite, suffer from indigestion and, consequently, must become physically ruined. We make an ignominious failure in this case because we are too ignorant, or may be too stubborn to admit the possibility and dissect back to its origin the root of the trouble. Such cases are utterly unhappy, morose or melancholic, and, in most cases, entertain thoughts of suicide, although they seldom have the necessary courage to carry them out. Perhaps you doctors have wondered why Mrs. So-and-So, when you are called to her house or she comes to your office, so repeatedly says: "I wish, Doctor, I could go to sleep and never wake up. I wish I was dead. I am going to kill myself." You joke it off and say, "Your liver's bad, you need some calomel." Nevertheless, ever and anon, she repeats it again. To your wife you said, "She is hysterical, she is a neurasthenic." To yourself you said, "There is a reason; I can't find it; I wonder *why*." But of this psycho-pathology we will say more later. Here let me observe that the field is so limitless, every thought taken up has so many ramifications, it is really difficult in the radius of a paper like this to carry the subject through in a sufficiently concentrated form. The intricacies of love show many and varied anomalies, and we will not have time to even touch upon the anomalies based upon anatomical defects. Gynecology has long entirely neglected the psychical part of its specialty and has directed its attention entirely upon diseases that require surgical interference or other local manipulation.

Perhaps that which worries the doctor as much or more than any other one thing is the so-called neurasthenia or hysteria. When there is a state of steadiness, force of self-command, the person is said to possess good nerve; but where there is a condition of hyperesthesia which makes the individual easily agitated, unusually susceptible or readily irritated and lacking in control, we are in the habit of calling such a person "nervous." Nervousness, or neurasthenia, means without nerve strength, and is a deficiency or exhaustion, or perversion of nervous force, as well as debility of the nervous centers. If then sexuality is so important of the natural instincts, can we not claim it too as one of the most important and frequent factors in the stability of the general nervous equilibrium? We do not all begin life with the same amount of nerve capacity or nerve force, and neurasthenia can very properly be classified as congenital and acquired. Of the causes of the acquired, most authors mention first anxieties attendant upon love affairs, religious matters and the sexual passion, particularly affecting our women, while among men the business cares constantly increase the number of neurasthenics.

Of such persons a few may be cheerful and good tempered, but the vast majority are fretful, moody, irritable and depressed.

There is often a distressing sense of pressure at the top or back of the head, which is accompanied with tenderness and stiffness of the muscles at the back of the neck. Palpitation of the heart and a beating or throbbing of the aorta in the region of the stomach are often annoying to these patients, and a nervous cough, which may be marked and obstinate, but without any local cause, is sometimes harassing for an indefinite period.

The most important and frequent disturbance of the special senses are disorders of sight. Among other morbid feelings of the neurasthenic are "hot flashes," which are often a serious annoyance and sometimes attended with visible flushing of the face and hands. "The hot blush on the cheek of modesty, the ashen pallor on the face of fear, the beads of perspiration upon the brow of responsibility, and the parched breath upon the lips of embarrassment, are but passing shadows of the fitful play of vaso-motor innervation."

The most serious, and, therefore, the most important disturbances of function in neurasthenia are disorders of digestion. If the appetite, digestion and power of assimilation are disturbed, the patient may become greatly reduced in health because the tissues of the body cannot be properly nourished. This condition is very common and by far the greatest number of dyspepsias are of the nervous variety. We see the dyspepsia, but don't even see the nervous cause, much less going still further and find the cause of the nervousness. Constipation and diarrhea are frequent in neurotic persons. Sometimes there is some obviously manifest disturbance of the sexual function, and this is then ascribed to the neurotic diathesis when really this neurotic condition is a direct result of the sexual disturbance or perversion.

Power, of England, has investigated the relations of the sexual system to eye disease and points out that many serious complaints of the eye are caused by abnormal sexual relations and by disorders of menstruation, and the frequent association of difficult vision with sexual disorders would indicate that eye troubles were secondary rather than a cause of many of the symptoms of defective innervation.

Except for the natural instincts running amuck, the two horrible, so-called social diseases, syphilis and gonorrhea, would soon be under effective control. But of this phase, familiar to all advanced students of medicine, we cannot here dwell, but, with a myriad other equally important phases of the subject, leave for personal study.

We wish rather to present some thoughts not so commonly expressed, and to emphasize the fact that the subject is of vital importance from every viewpoint, that it deserves more extended study by the profession and that many lamentable conditions can and should be understood and corrected. I should like to quote from Howard, a non-medical writer, who very aptly sums up the whole matter as follows: "The animating impulse of all organic life is the sexual instinct. It is that which underlies the struggle for existence in the animal world and is the source of all human endeavor and emotion. That affinity that draws the two sexes together for the production of a new being, that overmastering, unanswered impulse, is the most powerful which pertains to the human family, and has ever been the cause and subject of man's most exalted thought. There is an intimate and unavoidable relationship existing between the mind and the sexual instinct, and, were man deprived of this instinct, all ambition, affection and endeavor, all poetry, art and religion, in fact, all emotions and achievements inspired by what we term love, would cease, and the world would become cold and passionless, destitute of sentiment or aspiration, devoid of any incentive to progress or energy, while the intimate and reciprocal machinery of human society, robbed of its motive force, would come to a stop and crumble away in hopeless disorganization."

The intimate association of the sweetest and noblest with the most carnal human emotions, was observed by Marion Crawford, who wisely states, "There can be passion without love—there can be no love without passion."

This sternly practical age has made the days more prosaic and lessened the amount of true sentiment and romance; but healthy, active differential organs will ever cause hearts to grow fond and manners gentle.

Civilization has refined and educated, but the primal instinct is still the same, and there will always be marriage and giving in marriage.

When people live closer to nature, they will be less *nervous.*

With the Celestial fire kindled in the hearts of both wife and husband, the whole family circle will be illumined, and this can occur only with the proper functioning of the *natural instincts.*

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THE PILLOW AS A HEALTH FACTOR.

By

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BY MEANS of various remedies and the application of hygienic principles, we are able to accomplish much for our patients; but it happens that not infrequently after we have done the things which ought to show good effects the patients fail to show up well as ground grippers. Continually they are sliding back towards their original conditions.

For this reason, we are continually on the search for hidden sources of ill—for the X factors in etiology. It is to one of these factors that I wish to direct professional attention in this study of the pillow. That it is a topic well worth the closest attention goes without saying when once we reflect that one-third our lives are spent with our head on a pillow, and associate with this thought the knowledge that in the head and neck are the most essential structures of the body.

Features of the Ideal Pillow.

1. *It should be so adapted to the individual user that it puts the rest-plane of the body and that of the head in parallelism.*

What is meant by this is easily seen from a glance at Figure 1.

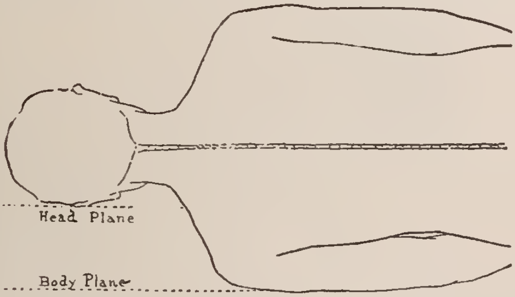

Fig. 1.

2. *It should be comfortable without being luxurious, thus tending to build up resistance.*

The power to resist the action of deleterious influences of various sorts is what we most need to cultivate.

3. *It should give equable support to the whole side of the head, face and neck, down to the shoulder, and be so constructed that it allows for the greater breadth of the head in its biparietal diameters.*

I have given much study to this feature, as it is plain enough that the base of the triangle, formed by the head being turned upwards, with individual on the side, is what makes rest on a firm and extensive flat surface so trying to the neck muscles. The ideal pillow, therefore, should be small, so as to allow the biparietal diameters to come over the top, or upper edge of the pillow. In this way the space shown in Figure 2 is fully filled by the pillow without causing muscular strain.

4. *The contents of the tick must be get-at-able.*

Feather ticks have to be tight, and should never be used in health pillows. After much experimentation I am convinced that long, curled hair is the best material for filling. But hair tends to mat, and for this reason alone it must be get-at-able. Moreover, pillows should be so made as to insure thorough cleanliness. A placket in the tick is, therefore, essential, through which the contents can easily be removed and the tick and contents sterilized, or at least washed. The value of such a pillow in surgery cannot be overestimated; and yet I venture to say that not one surgeon in a thousand has given his patient's pillow much thought.

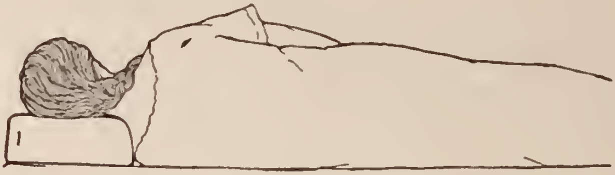

Fig. 2.

What the Common Pillow Does.

1. *It pushes the head into unnatural and harmful positions, straining muscles, especially those of the neck and shoulders, and compressing nerves and blood vessels.*

The ill effects of such repeated positions do not at once appear. Our natures are tolerant; but pernicious habits are bound to produce results after their kind.

2. *The common pillow is uncomfortable, and for that reason alone ought to be discredited.*

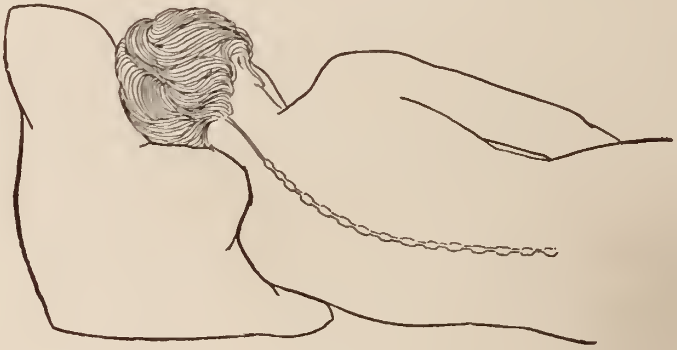

Fig. 3.

It was during a night of wakefulness that my attention was turned most emphatically to a study of pillows. I am sure that everyone of my readers has experienced discomforts in the use of the ordinary pillow.

3. *Common pillows are bought at the stores, and without reference to the requirements of the users.*

Accordingly we see little people sleeping on big pillows, and big people sleeping on little ones. No discrimination has hitherto been made.

4. *There is no convenient way of keeping common pillows clean and aseptic.*

5. *The common pillow is chosen chiefly for its softness.*

That is one reason why there are so many soft people in the world.

6. *Feathers have more or less of the "drawing" effect of a poultice.*

From a soft feather pillow in a hot climate, or on a warm night in any climate, good Lord, deliver us!

Who Should Use Physiological Pillows?

1. The well cannot expect to continue well unless they conform to physiological requirements. The most essential feature of medicine is *Prophylaxis*

2. To those suffering from acute disease, and to surgical patients, the Physiological Pillow is a Godsend.

It keeps the head cool.

It preserves coincidence of head and body-planes.

It can be cleaned thoroughly every day, if necessary, and without inconvenience.

It vastly increases the chances of a happy and speedy recovery.

3. It does much for those suffering from chronic disturbance. Disease is disorder. Disorder is the product of contributing causes, just as a river is the product of many streams. An ill-fitting pillow is a predisposing cause of physical disorder, and cannot fail to be a serious handicap to recovery. In the stern fight with disease one should eliminate all recognized drawbacks.

4. Disease tendencies are both inherited and superinduced. Every child ought to have its own pillow, which should be fitted to that child's physical characteristics.

5. Like an army in retreat the aged ought to resist every effort of the enemy to precipitate a stampede. Every inch of the way should be held as long as possible. Aged people ought to shun soft, downy, conventional pillows as they would the very Devil. Physiological pillows tend to correct stoop shoulders, and to prevent sagging facial tissues.

Sleeping Without a Pillow.

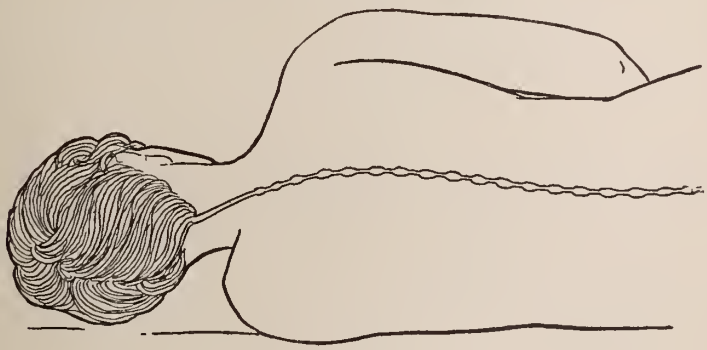

Fig. 4.

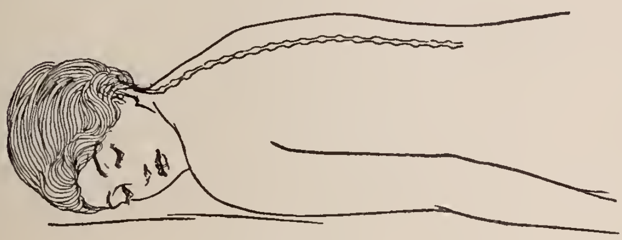

Fig. 5.

I have not yet found anyone entirely free from physical disorder who follows the plan of sleeping without a pillow. Figures 4 and 5 illustrate unnatural positions incident thereto. It is a practice not to be commended.

EDITORIALS.

Conducted by

MARC RAY HUGHES, M. D., DAVID S. BOOTH, M. D.,
BAYARD HOLMES, M. D. THOMAS D. CROTHERS, M. D.

PSYCHANALYSIS.

The New York Medical Journal, discussing neuropathic cases, remarks that "in recent years, however, a great light has been thrown on the whole subject by Freud and his school. To be sure, he has ardent detractors, some of whom go so far as to deny the new psychology any merit whatever. Even those who cannot accept psychanalysis *in toto* are usually willing to admit that there is enough truth in it to repay further investigation."

The *Journal* does not clearly recognize that to admit a half truth does not mean to ignore the sophism imbedded in it. Every truth is overshadowed by a sophism more like truth than truth itself. Ives Delage,[*] the French biologic alienist, calls psychanalysis a psychosis and points out that without regard to the psychologico-etiologic moment psychanalysis reads into the infant at the breast a sex meaning to actions based on simple motives like hunger. The reproductive instinct is, it is true, an evolution from the nutritive,[**] but the nutritive precedes the reproductive in evolution and must, therefore, do so in the development of man. There are, according to Ives Delage, to the psychoanalyst but two factors in man, the complexes and the censor. The first is eternally striving to rise to the surface of consciousness, the last, the weaker, is ever striving to drive them back. "The psychoanalysts thus assume a pseudo-profundity in their view of details. They are industrious but ridiculous. Their questions set men's back up, cause modest women to blush and make the pruriently frivolous giggle." The tyranny of the obvious which evolves from the observer's internal consciousness, explanations closely allied to those of the egocentric analogizing tendency of the child, primitive man and the lunatic, is ever present in the symbolism of the psychoanalyst. G. L. Wells finds sex food symbols in the following: The same colloquialism is used in England for appetite as in America for penis: "Kisses" is the name of a sticky confection. A systematized delusional female claimed that through electric persecution of her genitals she felt "as if there was eating and drinking going on down there." There often crops up in sex matters the old relation between the nutritive and the sexual. But this is more logically explicable by other psychologic factors than the Freudian consciously symbolic.

The bride cake[†] passed through a wedding ring is a well-known charm to secure marriage. This cake and the "kail," "broose" or sack posset were competed for in ways that recall the ceremonies of marriage by capture among certain Polynesians. After the male has eaten a fish closing the vagina, the lovers sup from a cup afterward placed in the vagina; often after, but generally before coitus. In a case reported by Willard Parker,[††] of New York, a sixty-year-old debauchee placed a goblet in the vagina. In a case reported by N. A. Tolmatcheff, of Kazan,[‡] a small wine glass was introduced. Placation of "spirits" attendant on women occur thus quite frequently, but are usually regarded as sadistic expressions. There is an obscure idea of preventing "ill luck" behind them. Children often "feed" their vaginas. This comingling of comensal and sexual ideas crops up in the insane. The vaginas of the patients of a ward in the Cook County Insane Hospital (under charge of a female medical politician) contained decomposed food placed there under an obscure idea of "feeding" the sexual apparatus.

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[*] *Jour. of Mental Science*, January, 1917.

[**] Psychology of the Sex Appetite, *Alienist and Neurologist*, 1891.

[†] Brand's Antiquities.

[††] *Amer. Jour. Med. Sciences*, Vol. XVIII, 1849.

[‡] Rusky Vratch, 1892.

The notions connecting food and sex are therefore not necessarily Freudian "complexes" seeking to elude the "censor." To an alienist free from Freudian and Kräpelin bias, imbued with the broad philosophy of the great French, German, Italian, American, Scandinavian and Russian psychiatric clinicians, Freudian symbolism has an uncanny suggestion of the paranoiac and primitive reading of egocentric significance into things. Under suggestion of the psychanalyst the cloud grows "very like a whale."

The medical editor* of a Chicago daily thus depicts the process and its rationale at the Johns Hopkins psychologic laboratory:

"Do you blush easily? Are you anxious and harassed? Do you worry about 'something happening?' Have you iron in your soul, a bleeding heart, a crown of sorrow? Are you, like Niobe, an ocean of tears? If so, experimental psychology offers you a real, ready relief, without medicine, osteopathy, chiropractic or any other so-called royal roads to health.

"It has been discovered that there are submarines of the mind, just as there are in the sea. Whenever a girl or youth, child or adult, submerges a hope, nurses a secret fear, a hidden ambition, a silent intention of revenge or reward, these submarines of thought and emotion, until routed out upon the surface of the intellect, actually threaten the even tenor of your way.

"Like the ocean itself, which rises, say, in a narrow channel, your knowledge and intellect in use, the parts of speech and thought available to you—that which you "have in mind" at any time is only a small part of the submerged whole. Like the almost bottomless ocean, there is an unfathomable depth of knowledge and experience even in the most ignorant mind.

"The hopes, fears, loves, hatreds, wishes, aims and distress stored away and seemingly forgotten are actually and effectually at work upon you. They make and mar your progress in life and they determine unconsciously your triumphs and failures. your anxieties and happinesses, your joys and your sorrows.

"This is why experiences in life should be pleasurable. It also explains the meaning of play in childhood, the pleasures of youth, the enduring qualities of recreations and vacations. The stored-up reservoirs of harmless pleasure are a granary full for all time, a reservoir of wealth, a banking capital that never fails.

"These things are seemingly forgotten. They, like unpleasant experiences, disappointments, frights and shocks, are suppressed apparently from mind and memory. Yet, like the cues which are unnoted but send actors and actresses on and off the stage in the smooth sequence of a lifelike drama; like the unseen strings which move the marionettes of a Punch and Judy show, so the loves and hates, frights and joys, move you through the greatest of all stages, this life itself.

"John Smith (a pseudonym) came to the psychologic laboratory after doctors, drugs, philosophies and all sorts of healing procedures had failed. He was 'unable' to 'remember things,' 'he could not work,' 'he could not face his friends,' 'he was always in a doze,' 'he felt as if he were going out of his head.'

"This state of vexation had become chronic. He was 31 years old and it had been going on several years. Medicine and 'mind cures' were both failures; nor did the osteopathic theory of 'hard bone pressing on soft matter' help him."

It took sixty days of "psychanalysis" to bring the "submarine" to the surface

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*Bowers, *Herald Magazine*, May 6, 1917.

and then he was "cured." It is obvious that the "soul poking" as psychanalysis is irreverently called, put in the "submarine" as well as took it out. The optimistic obsession of being cured will dominate for a while but such "cures" like the similar ones of Eddyism, osteopathy, etc., do not remove the underlying constitutional disorder.

To understand "cures" that result from bringing the "submarine" to the surface the etiologic moment must be fully analyzed. This consists of the congenital constitution, this constitution as affected by environment especially at the periods of stress and at the time the exciting factor is applied. The neuropathic or hysteric constitution is not created by the sex trauma but this is a reaction varying in extent according to the emotional state at the time it occurs. While the terms neurotic, neuropathic and hysteric are used interchangeably, they imply things differing in extent. The neurotic has risen above defective ancestry, hence has superior inhibitions. The neuropath has, after birth, fallen below higher ancestry, while the hysteric may be of defective ancestry or have fallen below high ancestors by environmental strain, after birth. Sex trauma. while it may work in a vicious circle with the constitution which gives it birth, can have little creative effect. Freudian ideas as to the censor and complexes are very crude renditions of the primary ego which is egocentric and the secondary ego which recognizes the rights of others in opinions and to the pursuit of life, liberty and happiness. This is a late acquirement of the race best epitomized in the Golden Rule. In the three types of hysteric, neuropathic and neurotic, there is a disequilibration in sensibility and will power. Mobile humor exists in direct relation to facile impressionability to external influence or internal states. The nerves as DesChampes* points out, vibrate to sentiments from within and without and all are registered without proper relation. One fact chased by another is forgotten. Another produces a momentary hyperexcitation which takes the place of the truth whence falsehood is automatic and of a kind that the patient conscientiously denies. This disequilibration decidedly modifies the mental faculties. Intellectual activity is over excited but in diverse degrees and variable ways, according to the particular tendencies adopted. Absorbed by a preoccupation or controlled by an idea, they become indifferent to all else. Their ideas are abundant, and they rapidly pass from the idea to the act. Their vivid imagination, coupled with a bright intelligence, gives them a seducing aspect, but their judgment is singularly limited, attenuated or false. They judge from a non-personal standpoint excellently. They are quick at discovering the faults of others, even relatives, but faults rightly attributed to themselves are repudiated. Their memory is capricious. They forget their faults and their acts under impulse, albeit these may be consciously done. The cerebral type, a neurotic not a hysteric, is led by the intelligence. She has little or no coquetry; what coquetry there may be is the result of intention and temporary. There is an ethical sense, frankness and nobility in her ideas, disinterestedness and tact in her acts, and she is capable of friendship. Her tastes carry to her male pursuits, in which she succeeds. She becomes often what is called a "superior woman," but too often what is called a "misunderstood woman." She has but little guile. To the sensual type voluptuousness is the aim of life and the center of her acts and thoughts. She is well endowed with guile and extremely diplomatic. She is full of finesse, but not very delicate. Her lack of scruple often spoils her tact. She is ruseful, dissimulating and unconsciously mendacious. She despises friendship and needs watching. If circumstances permit she loses all delicacy, reserve and modesty. She is destitute of scruples. Her crimes are cooly remorseless. The neuropathic type is one to which the grasshopper is a burden. Her nerves are always on edge. She is a heroic invalid who displays the air of a martyr about trivialities. Hysteric voluptuousness finds vent in perverted expressions; the method takes the place of the object aimed at. Sexual frigidity as to physical expression results in intense sexual preoccupation, which finds

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**Bull. Gén. de Thérap.*, 1891.

algolagnic satisfaction in pain caused others by pornographic language. The primary "ego" is peculiarly dominant here in an auto-erotism where the sexual emotion and desire are not only nearly absorbed and lost in self-admiration, but this self-admiration finds intensification by the agony of others. Auto-erotism of "Narcissus type" appears in women in excessive use of the mirror. It exists in greater degree in primitive man, where in the male, ornamentation is most marked. Civilization tends to increase this "Narcissus" factor in women, but has given it a more altruistic tinge through intensifying desire to be attractive to the male. In defectives lacking potentialities of the secondary "ego," this tinge intensifies and intermingles with the primary "ego," whence occur the coquette, the harlot type and the auto-erotic pervert, destitute of homosexual or heterosexual tendencies. This last type occurs with peculiar frequency among the social "purists."

With the removal of the higher inhibitions by the sleep states more marvels occur. Thus Stekel,* in his recent work reports the case of a woman (evidently from the sensory phenomena depicted) hysteric who had the following dream: She was in a room of an armory filled with gymnastic and electric apparatus. Dr. Hochstehter stood in scanty attire on an automatic weighing apparatus. He made a face at her when she entered, like a bad child who won't play. Dr. Stekel asked him to behave but without effect. He had on only a clean pair of pants and a dirty flimsy silk shirt full of spots and tears and looked disgusting. She also was in scanty attire. She started to dress herself when she felt a one-sided numbness and then a pain when asked sharply about it. Dr. Hochstehter was, in Stekel's opinion, a symbol of his (Stekel's penis (*Hochstehter*, up stood he), with which she wanted to experiment. The dirty shirt was an expression of her opinion of his conduct in refusing this. Here Stekel, like Freud,** goes far beyond the fundamental—and, as Havelock Ellis believes,† undeniable—proposition that dream-imagery is largely symbolic. He holds that behind the symbolism of dreams there lies ultimately a wish; he believes, moreover, that this wish tends to be really of more or less sexual character, and, further, that it is tinged by elements that go back to the dreamer's infantile days. As Freud views the mechanism of dreams, it is far from exhibiting mere disordered mental activity, but is (much as he has also argued hysteria to be) the outcome of a desire, which is driven back by a kind of inhibition or censure (*i. e.*, that kind of moral check which is still more alert in the waking state) and is seeking new forms of expression. There is first in the dream the process of what Freud calls condensation (*Verdichtung*), a process which is that fusion of strange elements which must be recognized at the outset of every discussion of dreaming, but Freud maintains that in this fusion all the elements have a point in common and overlie one another like the pictures in a Galtonian composite photograph. Then there comes the process of displacement or transference (*Verschiebung*), a process by which the really central and emotional basis of the dream is concealed beneath trifles. Then there is the process of dramatization or transformation into a concrete situation of which the elements have a symbolic value. Thus, as Meader puts it, summarizing Freud, "behind the apparently insignificant events of the day utilized in the dream there is always an important idea or event hidden. We only dream of things that are worth while. What at first sight seems to be a trifle is a gray wall which hides a great palace. The significance of the dream is not so much held in the dream itself as in that substratum of it which has not passed the threshold and which analysis alone can bring to light." Freud's view is purely psychologic, ignores the physiologic and pathologic elements demonstrated by Maury and others. In discussing the wish content, Freud ignores the degree of symbolism which local physical sensations rising into sleep mentally produce. These play a large part

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**Die Sprache der Traumen.*

**Interpretation of Dreams.

†World of Dreams.

in the symbolism of dreams even as to the so-called wish content of Freud. Erythemas making their onset during sleep thus occasion startingly vivid dreams with consequences persisting during waking consciousness.

The whole dream phenomena of Stekel's case could result from the transference of the hysteric anesthesia (indicated in it) to the tingling usually felt after numbness. Electric sensations are often compared to this. Of course intense sexual preoccupation of the hysteric tinges dreams and is the source of frequent false accusations. Dreams are not rarely productive of delusions of memory and have led to litigation as C. C. Hersmann* has shown. In 1906, in Chicago, a declaration in a civil "dream suit" of a public school teacher,** against a traveling salesman, was filed. The formal legal pleading made the first direct charge against him that he attacked the teacher. She asked $10,000 damages. The strange set of allegations on which the suit is based are chiefly hinted at in one paragraph of the declaration which states the said defendant fraudulently concealed from the knowledge of this plaintiff for a period of five years that he, the said defendant, was the person who had committed said attack upon the said plaintiff; and the plaintiff avers, that it has only been within the past five years that she discovered that the said defendant was the person who committed the said attack on August 31, 1904. So seemingly unreal was the incident which she says all but wrecked her life, that it seemed to her at the time a mere dream. She was in her own room. She seemed asleep. In countless hours since then she has racked her brain to recall any other mental evidence that she was not dozing at least. But the first impression—the shadowy, cobwebbed impression of the dream—is all she can recall. But whether awake or asleep she saw, whether a real man of flesh and blood or unsubstantial illusion, at any rate, a figure steal into her presence. The mysterious intruder crept toward her, took her by the throat at the instant she was preparing to scream, pressed a handkerchief to her lips—she remembers nothing more.

The next morning a sense of fright held her. She believed it was only a psychologic after-effect of her dream, which would pass away in the distraction of the day's occupations, and started to tell of the dream at the breakfast table of her boarding house, "I dreamed there was a man in my room last night———" she began. Instantly other conversation was hushed and all eyes were directed at her. She says she heard another boarder remark to the defendant who also sat at the table, "If she knew it were you, she would kill you." In her confusion, however, she said, anxiously: "Surely it must have been a dream," and the other boarders reassured her, saying that it couldn't have been a reality.

But the memory of the dream haunted her. The time came when she no longer could attend to her duties as a teacher properly and she resigned. At last, so run down physically did she become, that she consulted physicians and told them her remarkable story. The physicians, she claims (albeit they deny it) assured her that there was evidence that her experience had been more than a vision. Then, she says, there leaped back into her mind the memory of that remark whispered in the defendant's ear at the breakfast table the morning after the dream. When her suspicions became conviction, she retained an attorney and had him bring the suit. The judge directed the jury to acquit on the plaintiff resting.

A psychoanalytic attempt to remove the "submarine" here would have resulted in charges of conspiracy with the rapist, against the psychoanalyst. Even the litigation didn't remove the "foreign body" in consciousness.

The Freudian reaction from driving back of repressed desire in a neuropath, hysteric or neurotic instability has found expression in many sects where the ethics of the Golden Rule vanish into egocentric religiosity. Thus through the emotional

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**Alienist and Neurologist*, 1897.

**Benedict vs. Barrett.

upsets of early Christianity sprang sects* which in very unequivocal form still survive. The Nicolaitans held that sensual pleasure was the true blessedness of man here and the great end for which he was created and that in the future life this realization would be immeasurably increased. Basilides was a fountain—or rather a sink—of all uncleanness. The followers of Carpocrates permitted and recommended sensuality and crime. Only those who daringly filled their measure of iniquity were saved; the only sin was in opposing the appetites and passions which God had implanted. The sect enjoined surrender to every carnal inclination, and their practices were in keeping with their doctrines. One sect entertained the stranger with all the plentitude of bed and board. After the meal was disposed of the host would arise and say to his spouse: "Go, exhibit to our guest your charity," while he retired, that they might exercise their generating impulses. The Nazarians adore God and believe in Jesus as a prophet. They pray indifferently to the Apostles, the Virgin and the ancient prophets. They practice baptism by immersion, celebrate the Nativity, the Ascension and some other festivals, the most solemn of which they call the Festival of the Womb. In this solemnity they salute women with holy respect and affectionately embrace their knees, thus bringing the man's head on a level with the woman's abdomen. From this comes their title of Worshipers of Adorers of the Womb. They allow plurality of wives and exalt sensuality into a moral maxim. On the day of the Circumcision—that is their New Year—the women gather together in the hall of sacrifice. The windows are closed and the lights are put out. The men then enter and each takes, by chance, the first woman he finds. This licentious ceremony is renewed several times a year, particularly at the Feast of the Womb. The chief and his wife at these times mingle on a level with the others.

The principles enunciated by these sects were carried into practice by the Antinomians, who held that the elect could commit no sin and were under no bond, having been made free. One modern Illinois sect, the "Spirit Fruit Culture," was founded in the 70's of the nineteenth century at Lisbon, O., where its "heaven" still exists. The founder, a wealthy, poorly educated farmer, who was of a little less culture than Schweinfurth, of "Child of the Holy Ghost" fame, of Rockford, Ill., runs the community on the principles of whose violation (reversion to private property) Ananias and Sapphira were punished. The sect sensually adopts the early Christian practice of "in love preferring one and other." "Free love" takes the place of marriage with this sect. It is much more delightful and does not result in the woe that accompanies mismating of couples. Every man in this society distributes his love impartially toward every woman. For one woman, of course, he may feel a stronger affinity than for another, although loving both the same, and if he does, that woman is his sweetheart. From the printed literature of the sect it would appear that their other dogmas are a mixture of Carpocrates' and Nietzsche's teachings.**

"Self-control is the only devil there is. The marriage law is for fools. Parents have no more responsibility in connection with their own children than with their neighbors' children. Man is free. He has no right to be limited to one woman or to one family of children. His neighbor's children are his children, and his children are his neighbor's. Empty yourself of all personal desires and the desire of the Universal Spirit will manifest itself through you. Take no thought, have no wants, make no plans. Give your personal self to Spirit and it will then make no difference what you say or do. It is Spirit's business, not yours. Don't dictate to Spirit. If she wants you to rob and steal and go walking with another man's wife, do it. The object of life is to be of use. Don't use God Almighty; let Him use you. Monogamy is the product of man's self-consciousness, and self-consciousness is the devil. Be absolutely non-resistant, else Spirit can do no work through you. Never say 'my wife,' 'my husband,'

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*Campbell: Phallic Worship.

***Alienist and Neurologist*, August, 1904.

'my daughter' or 'my son.' Not one hair in their heads belong to you; they are all God's. What they are, or say, or do, is God's work and no business of yours. Woman has a right to more than one man, and man to more than one woman. Whatever Spirit manifests a disposition to do is right. If a woman is jealous, she needs to have the experience that will make her jealous, else she will never overcome the devil of jealousy. Love is universal; it is not limited to one woman or one man."

The quaintest phase of allegedly beneficial effect of psychoanalysis is that expressed thus editorially by the *New York Medical Journal* (Dec. 23, 1916):

"Many interesting revelations in the domain of functional nervous disorders have been disclosed by the present European war. In the first place, the old dictum that nervous conditions do not manifest themselves externally has been verified by the large number of neurotic candidates that passed the physical examination only to break down under the first severe strain in the training camps or trenches. It is quite evident that only men with strong constitutions are fit for the mental and moral shocks of war. Another important observation derived from a survey of the nervous victims is the realization that modern warfare imposes tremendous nervous tension and mental strain, so that adequate provisions should be made to take care of all the neuropaths. This is a phase of preparedness that we should do well to keep in mind, and in which we may profit by the experience of others. Finally, some interesting light has been gained from the war concerning Freud's theories of the psychoneuroses, and the value of psychanalysis as a form of mental training. The severe demands of war and the rigid discipline of military training have quickened the instinctive emotions and transformed the repressed energies into great and heroic bravery. Suppressed desires and buried complexes may be factors in the blight of overcivilization, but in time of war these primal instincts find an outlet for themselves in the call of duty and patriotism. However helpful psychanalysis may be in time of peace, in time of war such methods appear unnecessary and undesirable. In fact, the conviction is forced on us that well directed discipline is superior to psychanalysis at all times, and that personal development and happiness cannot be divorced from self-sacrifice. It is fair to assume that some of the concepts regarding the fixation of the libido, and the correct psychanalytical treatment will be greatly influenced by the experiences of the war."

This reduces the human mind to a bundle of reflexes such as existed ere the cerebrospinal system developed.

In the January 6, number, however, the *Journal* takes another view:

"Besides the disciples of Freud, who, so to speak, worship at his shrine, there are others who, starting out under his leadership, have gradually developed schools of their own, differing from Freudism in many fundamental ways. Thus Alfred Adler, gives a theory of the neurotic constitution based on organic inferiority and overcompensation through the central nervous system. Not to go too deeply into his theory—and indeed it cannot be stated succinctly enough to be quoted here—it is interesting to the general practitioner to learn that there are certain epochs in the life of a neurotically predisposed patient when he (or more usually, she) is especially liable to develop a neurosis or a psychosis. He names ten such epochs, as follows: "The desire for sexual knowledge, the onset of menstruation, the epoch of menstrual activity, the epoch of sexual activity, the selection of a spouse, pregnancy, the puerperal state, the climacteric, the choice of a vocation, and the danger of death.

Whether we are inclined to agree with Janet, with Freud, Jung, Adler, Ferenczi, Stekel, or any other of the psychopathologists who have investigated the hysteric from the analytic and genetic viewpoint, or whether we are inclined to call such a patient merely "nervous" and treat her with ammoniated valerian and suggestion, at least it is valuable to know that there are definite periods in her life when she is predisposed to the outbreak of grave disorders, so that we can protect her, so far as it is in our power, from exciting or precipitating causes at those times."

Adler substitutes a decidedly artificial simple sex classification for the earlier physiologic classification,* applicable to both sexes. However, Adler indicates an advance since he recognizes the constitutional factor Freud ignores.**

THE VEGETATIVE NERVOUS SYSTEM.

Much illuminating work is being done upon the normal and abnormal action of the vegetative nervous system, the result of which is reflected in the recent literature of the functional neuroses, notably among which are: "Vegetative Neurology, the Anatomy, Physiology, Pharmacodynamics and Pathology of the Sympathetic and Autonomic System," by Heinrich Higier, translated by Walter Max Kraus and running as a serial in the *Journal of Nervous and Mental Diseases*: "The Relation Between Overactivity of the Vagus System and Anaphylaxis," by James H. Smith, and "Histopathology of the Autonomic Nervous System in Certain Somatic and Organic Nervous Diseases," by Mary Elizabeth Morse, in the current January number of the same magazine; "Remarks Upon the Vegetative Nervous System and the Internal Secretions," by Frederick J. Fornell in the current April number of the *Journal of Mental Science;* and "The 'Nasal' Neuroses, Regarded as Sensitisations of the Respiratory Tract," by J. S. Frasier in current August number of the *Edinburgh Medical Journal,* all of which tend to demonstrate the importance of this system to health and disease.

The *New York Medical Journal* refers to "the relationship of this system to the activity of the ductless glands and to many biochemical phenomena, even what is now being referred to as acidosis, is being developed here and there. Many paroxysmal conditions, for which it was difficult for us hitherto to offer a satisfactory explanation, are now being re-examined in the light of our newer viewpoints and concepts, and the reflected light derived from the newer studies on the involuntary nervous system is now being permitted to illuminate many dark places. The reactions to many drugs are now understood and explained with the help of the newer knowledge of the involuntary nervous system. Here we may mention atropine and the belladonna group, adrenalin, pilocarpine, physostigmine, muscarine, choline, and the like. Serum sickness and the reactions to all sorts of foreign proteins (including those derived from bacterial infection, acute and chronic), are being viewed from this angle.

"From this standpoint, too, we are now beginning to look upon many of the symptoms due to intestinal parasites, the reactions found in the many food idiosyncrasies, and the phenomena observed in asthma, hay fever and spring catarrh, juvenile emphysema and eosinophilic catarrh, mucous colitis, urticaria and angioneurotic edema, and many other allied conditions. The explanation of even migraine, if approached from this angle, is much simplified when we bring it into relation with localized instability of the involuntary nervous system.

"The method of action of the emotions and psychic stimuli—trauma and shock of all sorts—in producing their many visceral disorders, can now be appreciated. The effect of toxins and of the ductless glands is so much the better grasped.

"The whole problem of anaphylaxis, infection and immunity is now being attacked with these new weapons in hand. Here, too, let us not forget to mention the symptomatology which we come upon at puberty, the menopause, and some of the vague complaints found in the aged."

Not the least interesting is the reciprocal or, it may be at times, the antagonistic action between the vegetative nervous system and the endocrine glandular system, the various glands of which, either directly or indirectly through the endocrine system, have some effect upon the vegetative system (and *vice versa*), which demonstrates the great importance of the as yet too little understood endocrine system of apparent regulators of nervous energy.

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*E. S. Talbot: Degeneracy, Its Signs, Causes and Effects.

**Intra- and Extra-Uterine Periods of Stress Paediatrics, 1901.

D. S. B.

SELECTIONS.

CLINICAL NEUROLOGY.

THE EARLY DIAGNOSIS OF POLIOMYELITIS.—Wardner D. Ayer, *New York State Jour. of Med.*, writes that clinically poliomyelitis is characterized by a multiplicity of types and great variations in severity. Many classifications are given, but generally speaking the cases fall best into four types, namely, the "non-paralytic" or "abortive"; the "encephalitic"; the "bulbar," and the "spinal." This classification depends upon the development or non-development of invasion of the central gray matter and upon the extent and location of such invasion. This cannot be determined until the end of the first stage of the disease, so strictly speaking there can be no such classification in the early period. The early symptomatology, excepting, perhaps, the encephalitic type, is identical for all types and it is impossible to say definitely whether a case seen in this period, will on the one hand clear up without paralyses, and become a so-called "abortive" case or on the other hand develop extensive paralyses.

The three cardinal symptoms are fever, headache, and rigidity of the neck. Accompanying these but less constantly observed are tremor, drowsiness, constipation, retention of urine, sweating, and various hyperesthesiae. The symptoms can be explained best after a brief consideration of the probable pathologic mechanics of the infection.

It has been repeatedly shown that in monkeys inoculated intraspinously or intracerebrally with an emulsion of the spinal cord of a child dead of the disease, the subsequent development of symptoms in the animal is always accompanied by positive findings of the virus in washings from the nares of that animal. The reverse is also true, inoculation of such emulsions on the nasal mucous membrane being followed by the appearance of the virus in the spinal fluid and the onset of poliomyelitis. This is conclusive evidence that there must be a quite definite channel of communication between the upper respiratory tract and the subarachnoid space. It would seem then, that the virus having gained access to the nares, may pass upwards along the filaments of the olfactory nerve, through the cribiform plate of the ethmoid bone and gaining access to the sub-arachnoid space, establishes the first stage of the disease in which we are in reality dealing with a form of meningitis. There is an immediate reaction with a cellular infiltration in the meninges, and the spinal fluid, normally crystal-clear and cell-free, may be opalescent or turbid and is characterized by the presence of a cell content of varying degree and character. In the abortive forms the inflammatory reaction is limited to the meninges; it subsides there without further extension and consequently no paralyses result. But in the more severe forms there is a subsequent involvement of the substance of the cord with intramedullary changes. In the spinal cord there are no lymph vessels, but there are present definite perivascular lymph channels, serving as paths of communication between the spinal fluid and the intracellular spaces and it is along these that we have the extension of the infection to the nerve cells, thus giving rise to the perivascular infiltration which is so constantly seen in microscopical sections. It is not probable that this infiltration can be an evidence of a hematogenous mode of infection, which is so strongly championed by many observers. According to their views, this reaction about the vessels is sufficient to definitely establish the fact that the brain and cord receive the infectious agent through the blood stream and in no other way, and they further believe that the meningeal reaction is a passive or secondary process following the initial and more severe involvement of the cerebro-spinal gray matter. This is entirely inconsistent with the fluid findings and the clinical aspects of the disease. If this were true there would be no early period with distinct clinical signs of meningeal irritation and no pleocytosis in the fluids, which is present three to five days before evidence of cortical involvement.

When the case is first seen by a physician, the parents, as a rule, state that there was sudden onset of feverishness, with drowsiness, headache, general weakness, loss of appetite, perhaps vomiting; twitchings of limbs sometimes simulating convulsions may be noticed. Frequently such a condition exists for two or three days before it is fully realized that something more than a mild digestive disturbance is present. The rigidity of neck is seldom noted by the parents.

Following is a brief analysis of 102 cases seen by the writer in the acute stage. These cases are distributed over a wide territory and often only a single observation could be made. Consequently, it was difficult to obtain complete and satisfactory data on the individual case, and it makes a consistent analysis difficult.

Temperature—100 per cent. The average duration was eighty hours. The onset was usually abrupt. The average temperature observed was 102.2, the highest range being 104.8.

Headache.—99 per cent. This was noted in all but one of the cases. It was described as being of a general character and very resistant to treatment.

Rigidity of the Neck.—97 per cent. This was found in ninety-eight cases and was quite characteristic. It is rarely similar to the rigidity of meningitis which is most often a retraction. Retraction was only seen in two cases. The rigidity is an anterior-posterior one and may easily escape detection. On attempting to flex the head forward there is a sense of great resistance with evidence of considerable pain. The child cannot approximate the chin to the chest. There is, however, free movement laterally and posteriorly.

Drowsiness.—87.4 per cent. Ninety cases. The patients are distinctly apathetic. They don't want to move and evidence considerable irritability when disturbed. The mentality is always clear. A quite typical expressionless facies is observed, the so-called "Wilted flower appearance."

Tremor and Muscular Twitching.—60.7 per cent. This was noted in forty-two cases and described by the parents in twenty others.

Vomiting.—40.1 per cent. Vomiting was described as an early symptom, often ushering in the attack, in forty-one cases. In no instance was it constant.

Constipation.—36 per cent. Thirty-nine cases. The constipation was obstinate, resisting all medication.

Difficulty in Urination.—56.8 per cent. Sixty cases. This was a quite common finding—the child going sometimes twenty-four hours without urinating and then evidencing difficulty in starting the flow.

Sweating.—21.5 per cent. Twenty-two cases. This accompanied the severer types, and was noted in ten of the cases going on to bulbar involvement.

Reflexes.—No distinctive disturbances of the reflexes were observed. In twelve early cases they were exaggerated, in twenty-nine the patella, abdominal or cremasterics were absent. The pupillary reflex was retained in all cases. Diploplia was present in eight cases.

Kernig.—This also was not constant—a definite Kernig was observed only in eighteen instances.

Pain.—This was a finding of indefinite character, pain in the back and limbs being mostly complained of. A persistently severe pain in one or more extremities often preceded the appearance of paralysis in that location. Redness of the throat and heavily-coated tongue were common findings.

In most instances in the presence of an epidemic the diagnosis could be made from clinical signs but in some the symptoms were much more definite than the foregoing might indicate, and the diagnosis could only be made by lumbar puncture. The procedure is without doubt the most reliable and valuable aid in the recognition of poliomyelitis. The spinal fluid in this stage of the disease is quite definitely characteristic. There are, however, no pathognomonic and distinctive findings as are the organisms of a suppurative meningitis.

There is no doubt that poliomyelitis is caused by a specific organism, but at the present time we can only say that we are dealing with a bacterium so small that it will pass through the finest filter, filters which are impervious to all other known bacteria, an organism so minute that it cannot be seen individually with any known means of magnification.

The spinal fluid is often clear, and increased in amount, more often there is a slight opalescence and in few instances a distinct turbidity. In these fluids which are cloudy, a fibrin web formation or clot was seen on standing. There is a distinct increase in cellular elements. The character and number of the cellular elements in "poleo" fluids depends a great deal upon the time the puncture is performed. The polymorphonuclear leucocyte (or pus cell) often predominates in the first twenty-four hours, and the cells are found usually in greatest numbers at that time. These are rapidly replaced by lymphocytes, so that this cell is the one more commonly observed later. There is also present, in small numbers, a large mononuclear cell sometimes showing phagocytic activities, which is either of endothelial or ependymal origin.

Examinations of the fluids were made immediately at the bedside and the number of cells was estimated by means of the ordinary blood counting chamber.

The fluids that appeared clear to the naked eye never showed more than 300 cells to the cubic millimeter. The opalescent fluids showed 300 to 900 and the turbid or cloudy fluids all showed counts above a thousand. The average count observed in all cases was 420 cells to a cubic millimeter. The lowest being 65 while the highest was 1,230. No cell count was observed in any case, without some accompanying clinical evidence of meningeal irritation.

Increased pressure of varying degree was observed in seventy of these cases. In the remaining cases it was not increased. This bedside examination of the fluid was ordinarily considered sufficient but fluids showing a high cell count were always further examined by smear and culture for organisms. In all the cases of poliomyelitis the fluids were sterile. Without such examination an early suppurative meningitis could not at the time be ruled out. Appropriately stained smears from the centrifugalized sediment were also examined for tubercle bacilli. The absence of tubercle bacilli would not exclude a tuberculous meningitis, the cell picture of which so closely simulates that of poliomyelitis. This can usually be done by clinical signs. The chemical examinations of the fluids are not of great importance, except as confirmatory evidence. Specimens are characterized by the presence of an increased globulin content as shown by the butyric acid test and by an increase of albumen which is estimated relatively by nitric acid stratification. These findings must of necessity be present in any fluid wtih an increased cell count and in consequence the chemical examination is most often superfluous. The cells rapidly disappear from the fluid with the subsidence of the temperature, so that a few days after the acute febrile period is passed, the fluid is practically free from cells and although there may be a persistence of the globulin content, with a positive butyric acid test, the examination of the fluid in the later stages is of little value. It is due almost entirely to the fact that many fluid examinations have been made in this later stage and found negative, that there is a well-founded belief among many that the spinal fluid in poliomyelitis is of no diagnostic value. It is to be emphasized that the examination of the fluid alone is not sufficient to establish a positive diagnosis and it is only by the correlation of the clinical data with the laboratory findings that we can arrive at a proper diagnosis.

Among the conditions simulating poliomyelitis and coming up for differential diagnosis, the following were observed:

Abscess of the brain (two cases); suppurative meningitis (two cases); influenzal meningitis; tetanus; typhoid fever with meningismus; chorea; Bell's palsy or facial paralysis; acute articular rheumatism, and hysteria (two cases).

The encephalitic type is an interesting although rare form of this disease. It is without doubt a true encephalitis and is characterized by convulsions, unconsciousness and the development of spastic paralysis showing involvement of the upper neuroses. In its clinical aspects it could not be differentiated from various forms of meningitis. Three cases were observed in this epidemic—two cases died and the third case, although a fatal prognosis was given, cleared up entirely after the administration of three doses of immune serum.

Of the forty-two cases developing paralysis, eleven were of the true bulbar type, ten of whom died from respiratory paralysis. Of the thirty remaining cases fourteen showed paralysis of an entire extremity or more, with five deaths. Six cases developed facial paralysis and ten showed partial and slight involvement of an upper or lower extremity.

GUNSHOT WOUNDS OF PERIPHERAL NERVES.—J. Michell Clarke, *Bristol Medico-Chirurgical Jour.*, expresses the belief that we are not yet in a position to make positive statements as to what the ultimate results of nerve injuries and the operations undertaken for their relief will be.

The nerves most frequently affected are the musculospiral, median and ulnar in the arm, the sciatic, and especially its external popliteal branch, in the leg.

Injuries to the brachial plexus are also common.

A nerve may be (1) completely divided—when this is so there is rarely a clean cut through it, but more often destruction or obliteration of it for a considerable distance, from one to several inches; or (2) partially divided, or (3) injured by compression in scar-tissue, by callus, by fragments of bone, by a lodged bullet, or portions of clothing, or by a traumatic aneurysm, by bruising or concussion.

It is important to remember that perineural scars and adhesions, though conspicuous at operation, may not be responsible for blocking the passage of impulses, but that this may be due to concomitant intra-neural hemorrhage, fibrosis (neuroma), or molecular changes of concussion. Trotter and Davis have shown the intolerance of the ordinarily isolated nerve-tissue to the contact of connective tissue, and that the active outgrowth of nerve fibrils of a divided nerve is a response to the contact of non-nervous tissue, which on its part forms a tough, fibrous capsule around them, and prevents their further extension; this may lead to irritation of the nerve and hypersensitiveness.

The location of the injury to a nerve rests on anatomical data, and on the course of the projectile, aided by x-rays as to the presence of foreign bodies. In multiple wounds the diagnosis of the one causing the lesion is made from anatomical considerations. The extent of damage to the nerve is estimated by investigation of motor and sensory paralysis, muscular wasting, pains and hyperesthesia, trophic lesions, and electrical reactions, and all of these symptoms which are present should be compared, and the diagnosis based upon the full results. There is no short cut to diagnosis. Many consider that sensory changes give more important information both as to extent and progress of the lesion than motor paralysis or electrical reactions.

It has been claimed that in incomplete division of a nerve the area of loss to protopathic is greater than to epicritic sensation, and that the borders of the respective areas approach and recede from or cross each other; but this is not yet established.

It is certain that the distinction between complete anatomical division of a nerve and physiological blocking of it by involvement in scar tissue cannot always be made, for full sensory and motor loss with R. D. may be present in the latter.

Pains and hyperesthesia mean partial injury of a nerve; when these gradually disappear and give place to analgesia and tactile anesthesia compression of the nerve by scar tissue, callus, etc., is probably taking place.

Hysterical anesthesia of the sleeve, glove or stocking type may be present as a complication of peripheral nerve injuries, generally in partial ones. In gunshot wounds, however, especially of plexuses, the symptoms are often very complicated, and the sensory loss may not at first correspond with the known anatomical distribution of the nerves, and may resemble hysterical anesthesia, but after a few weeks partially clears up leaving a residual loss in recognized areas of nerve supply.

Electrical reactions give no information as to what is going on in the nerve at the seat of injury. The fact that electrical response does not go *pari passu* with voluntary power, is the chief reason why electrical reactions give such limited information as to the extent of injury to nerve.

As to treatment. Operations on cases in this country will be for secondary suture. Before operation can be done, (1) the wound must be soundly healed; (2) there must be a sufficient interval after the injury before exact diagnosis is possible, partly because characteristic signs of division of a nerve take time to develop, and partly because in most cases of gunshot wounds of nerves the extent of paralysis is at first more extensive than remains permanently.

Especially in wounds of a plexus, the immediate loss of sensation and motion may affect the whole limb, and after a time partially clear up, leaving a residual paralysis.

Whilst waiting, preliminary treatment must be carried out. This consists in wrapping the limb up warmly to protect it from cold and injury; in placing it on a suitable splint to keep the paralyzed muscles relaxed—a point of the greatest importance; daily gentle massage and movement, during which the paralyzed muscles must be kept relaxed; and electrical treatment by the passage of a constant current, or condenser discharge, rhythmically interrupted by a metronome, and just strong enough to cause a contraction of the muscle.

It is desirable before operation to give a prophylactic dose of tetanus antitoxin, as tetanus may develop after operation undertaken some months after the original injury.

Operation is advisable (and, *ceteris paribus*, the earlier performed the better the results) (1) in complete division of a nerve; (2) in incomplete lesions, (*a*) where the condition is stationary with a definite residue of paralysis after three to four months, (*b*) where improvement has begun but stopped abruptly, with signs of compression of the nerve by scar-tissue, callus, etc., (*c*) where there is great pain, not relieved after some weeks' careful treatment, the nerve should always be explored (pieces of bone, foreign bodies, or shreds of clothing may be found in the nerve); and (3) in cases of old standing with intractable trophic lesions, for even if no good to the paralysis results, the trophic lesions quickly heal.

In the majority of cases there is little difficulty in deciding whether operation is necessary or not. Even slight return of voluntary power negatives operation. In doubtful cases nothing is lost and often much gained by an exploratory operation, though occasionally the nerve may be found to be apparently normal in cases where the paralysis was complete. This is especially true of the musculo-spiral nerve.

In plexus lesions where several trunks have been divided, often at different levels with much perineural scar-tissue, accurate identification of trunks and end to end suture is most difficult, and if found impossible, it is probably better to leave things alone than to do indiscriminate nerve crossing.

The post-operative treatment, and that of cases of partial division of nerves is the same as given above in preliminary treatment, and should be continued daily until there is a return of voluntary impulses, which may take weeks or years. In the lower extremity a walking instrument must also be provided for dropped feet. After end to end suture of a nerve electrical treatment should not be begun for some little time, and then with great care.

NERVOUS AND MENTAL MANIFESTATIONS IN WOMEN IN RELATION TO THE GENERATIVE ORGANS.—Alfred Gordon, *Vir. Med. Semi-Monthly*, observes that facts dealing with the function of glands with internal secretions are few, but they are pretty well established clinically and physiologically. This is practically seen with regard to the nervous system. There are certain morbid manifestations observed, especially after castration, which are of such a practical importance that they deserve special mention. From a study of 112 patients in whom ovaries alone or ovaries and uteri had been removed, the following observation was made:

(1) Removal of the reproductive organs in women causes disturbances in the domain of the nervous system. The disturbances are of a purely functional character.

(2) The generally observed symptoms are: restlessness, difficulty of self-control, dissatisfaction with all and everything; difficulty of finding contentment in one's own efforts, want of interest in all absorbing subjects and objects, indifference, indolence and pessimism. Sometimes there are outbreaks of anger with a tendency to attack. Among other symptoms may be mentioned: insomnia, gastro-intestinal disturbances of a functional nature, headache, vague pains or paresthesia, tendency to obsessions is also observed in some patients.

(3) While individual symptoms resembled those of psychoses, nevertheless there were no true insanities.

(4) The psychic manifestations persisted with great obstinacy for several years.

(5) Individuals who presented various manifestations of psychoneuroses before they fell into the hands of surgeons, had their psychic phenomena decidedly aggravated after their uteri and ovaries or only ovaries were removed.

(6) As in the removed organs healthy portions of tissue were invariably found, it is to be supposed that the removal of the latter is in some relation to the morbid phenomena observed after the operations.

The conclusion seems to be that one must be very cautious in advising operative procedures on the generative organs, and the tendency should be to preserve as much as possible of any amount of normal tissue found in the uterus or ovaries. Operation advised on healthy organs only because a woman complains of vague nervous disturbances is to be avoided.

PHENOMENA RESULTANT UPON FATIGUE AND SHOCK OF THE CENTRAL NERVOUS SYSTEM OBSERVED AT THE FRONT IN FRANCE.—E. Murray Auer, *Medical Rec.*, notes that the manifestations of disordered function of the central nervous system resultant upon fatigue and shock occurring in the present war are of uncommon interest, having as they do for their etiology a more or less common factor, i. e., "a mine explosion" producing its varying effects upon the number involved, and because of their great variety, illustrate strongly the matter of "the individual equation" in reaction and resistance to outside influences.

"The functional nervous and mental disorders studied included those resulting from the general fatigue of duty and long marches, exposure, loss of sleep, terror, and 'shock,' which latter cases depended upon the activity along the firing line such as 'mine explosions,' charges, and shell explosions in the immediate vicinity of the individual without causing any apparent physical trauma.

"The symptomatology occurring as a result of these traumatic influences included disordered activity of the psychic, special sense, sensory and motor elements, invariably in combination with one phenomenon of disordered function accentuated."

Among mental and nervous states resulting from severe shock have been the following: hyper- and hypo-mental activity, characterized by increased motor and psychical activity such as playfulness, grimacing, flight of ideas, distractibility and rhyming of an acute mania; stupors, muscular rigidity, active deep reflexes, apathy and indifference; tremor and shaking; disturbances of memory ranging from simple forgetfulness to lapse of consciousness; dementia praecox precipitated by existing conditions of stress; inability to sleep and horrible trench dreams; neurasthenia; psychical pains; disturbance of organic functioning; vasomotor disturbances; abnormal sensations of all kinds and dyesthesia; loss of motor power, both of gradual and acute onset according to the nature of the shock; impairment of vision, resulting from prolonged fatigue or sudden shock; auditory disturbances of a hyper- or hypo-sensitive nature; hesitancy and loss of speech, and various kinds of tics.

Inquiry into the early history of the cases studied resulted, without exception, in the discovery of earlier neurotic manifestations. Physical examination showed nothing unusual other than stigmata of degeneration. Treatment consisted in isolation and absolute rest, with corrective measures and psychotherapy.—*Jour. of Mental Hygiene.*

SOME NEUROSES OF THE WAR.—J. Michell Clarke, *Bristol Medico-Chirurgical Jour.*, July, 1916, states that a neurosis, according to Gould, is an abnormal nervous action or an affection of the nerves or nerve-centers of a functional nature. Dr. Clarke excludes all cases which exhibit any one or more of the definite clinical signs which are usually associated with structural change in the central nervous system. He admits, however, that present conceptions of what constitutes functional, as contrasted with organic, lesions may require modification. Several observers have noted that organic lesions of the nervous system may be produced without evidence of external injury. Usually there will be found structural changes in these cases.

It is, however, possible that minute multiple lesions, especially if widespread, may through a massed effect give rise to symptoms or signs not recognizable by present clinical methods of investigation as due to an organic lesion, but rather to those of functional disturbance or neurosis. These shade indefinably into cases with undoubted signs of structural change.

As the neuroses of war are partly due to the same causes as those occurring in civil life, and partly to other special causes, some of them will be familiar while others present unfamiliar or special features. Hysteria, for example, exhibits the ordinary manifestations, namely, monoplegias, paraplegias, and hemaplegias, with or without sensory disorders and muscular contractures, affections of the special senses, such as deafness or amaurosis, and of special nervous mechanisms such as of speech, and of anorexia or vomiting. Most of them are quickly cured by the accepted methods, and cases of recent origin are more amenable to treatment than those of long standing. Hysterical paralysis in a limb may be caused by a wound which may be superficial or deep, slight or severe. Most commonly the paralysis is distal to the injury or does not extend further centrally than the position of the wound. Anesthesia is usually present and is of the glove or sleeve, stocking or sock distribution. The upper limit of the anesthesia is transverse to the long axis of the limb, as a rule is sharply defined, and the boundaries of the loss of the different forms of sensation are coterminous. All forms of sensation may be lost together, but those to light touch and pain are more frequently affected than those to heat or cold. Sensation to either heat

Classification of War Neuroses

By Major A. F. Hurst, R.A.M.C.

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A. PREDISPOSING CAUSES

(1) The congenitally nervous or "martial misfits" (2) A previous attack of neurasthenia	(3) A previous mental breakdown (4) Chronic alcoholism	(5) Concussion even years before

B. EXCITING CAUSES	Resulting Neuroses	Treatment
(1) Exhaustion due to: (a) Mental and physical strain (b) Toxaemia of acute and chronic infections (c) Insufficient food (d) Excessive heat (e) Pain and toxaemia of wounds	I. *Neurasthenia* (nervous, suprarenal and occasionally thyroid exhaustion)	Rest, followed by graduated exercise; sometimes adrenalin or thyroid
	II. Soldier's Heart	
(2) Emotion due to: (a) A single horrible incident (b) Prolonged and repeated horror, fear, etc. (c) Constant pain from a wound	III. *Psychasthenia* (amnesia; obsessions; phobias; tics; nightmares with secondary headache, insomnia and tremor	Suggestion with or without hypnosis
	IV. *Hysteria* (convulsions, tremors, paraplegia)	Persuasion, re-education, rarely hypnotic suggestion
	V. *Hyperthyroidism, hyperadrenalism* with harmonic form of "Soldier's Heart."	Rest, opium, belladonna
	VI. *Exaggerated Defensive Reflexes* (especially "auditory jump" and "visual flinch" reflexes)	Quiet and isolation
(3) Explosion of high power shells (a) Concussion i. Aerial ii. Contact (burial, sand bags, etc.) (b) CO poisoning	VII. *Shell-shock:* an organic basis (concussion symptoms) often with superadded hysteria (paralysis, deafness, mutism, blindness, etc.)	Rest for organic basis; persuasion and re-education, rarely hypnotic suggestion, for hysteria

C. CONDITIONS PREDISPOSING TO THE DEVELOPMENT OF SPECIAL SYMPTOMS	Resulting neuroses	Treatment
(1) Family or personal history of Epilepsy	VIII. *Epilepsy*	Bromide
(2) Mental deficiency (3) Mental disease	IX. *Insanity*	
(4) Syphilis	X. *Cerebral syphilis:* Tabes: General Paresis	Hg.: K. I.: Salvarsan
(5) Ocular defects, already present or produced simultaneously	*Asthenopia* and headaches *Hysterical blindness*	Glasses Hypnotic suggestion
(6) Aural defects, already present or produced simultaneously	*Hysterical* deafness; tinnitus	Hypnotic suggestion
(7) Previous or simultaneous injury of a limb	*Hysterical* paralysis, spasm or tremor of the limb	Persuasion and re-education
(8) Previous speech defect (stammering, aphonia, mutism)	*Hysterical* mutism, aphonia, stammering	
(9) Excessive smoking	*Tremor;* "Soldier's Heart"	
(10) Passed emotional disturbances or illnesses, which may since have been forgotten; these may influence III, IV, VI, and VIII		

or cold may be preserved and the others lost, or cold felt as warm. Attention to the distribution and characters of the anesthesia rarely leaves any doubt as to its true nature. The affected limb is often cold, bluish-red, and sometimes slightly edematous.

The cause need not be a wound. These troubles may, as in civil practice, occur after any injury. Hysterical contractures of the limbs without paralysis are not so common. Hysterical paralysis and anesthesia may complicate paralysis dut to an organic lesion. Lapse of time aids in clearing up the diagnosis, for the functional disorder tends to pass off. Even in hysterical paralysis of long standing there may be wasting of the muscles; it is of slight degree and affects the muscles of the whole limb. The electrical reactions are retained.

Aphonia may be present; there is a tendency to relapse, and it is difficult to bring about a permanent cure. There may be dumbness with or without deafness from shell shock. In most cases the cause was the shock of a shell explosion, with or without burial, sometimes producing loss of consciousness for varying periods, sometimes not, but in either case leaving the patient in a dull, dazed, or stuporous state, from which he emerged to find himself dumb and often deaf as well. In most cases hearing returned before speech. Recovery took place in some quite suddenly; in others gradually, with ability to pronounce a few words in a stuttering manner at first. Patients were aided by means of demonstrating to them the physiological movements of the lips and tongue in speaking. Some of them exhibited the eagerness to write what they cannot say, as seen in the classical type of this affection, but others were dull and apathetic. Similarly with those suffering from deafness without obvious lesion the patients did not make the efforts to hear that a deaf person does.

Hysterical vomiting occasionally occurred. It was cured by keeping the patients strictly on milk until vomiting had ceased for some time. Hysterical convulsions occurred in only one case. He had not suffered from epilepsy. There was a history of a slight wound, and a subsequent fall on the head from a height of six feet.

In other cases the hysterical features were accompanied by more or fewer evidences of a state of general nervous shock. These nuroses present symptoms or groups of symptoms not familiar in civil practice before the war. The causes are numerous—anxiety, overstrain, want of sleep, wounds, concussion from high explosives, noise, horrible sights, and fear. The most potent are the concussions caused by high explosives and burial in the débris produced by a bursting shell. The longer the patient was buried the greater the effect. In the majority of these cases of neurosis there is a history of mental or nervous disease in the patient's family. Occasionally the breakdown occurred only after the system had been weakened by some debilitating disease.

The chief symptoms noted are exhaustion or prostration, both bodily and mental, apathy even to the extent of an absence of the desire to recover, pronounced fatigability. There is often wasting or disturbance of nutrition, with or without anorexia. Depression, with loss of self confidence, is present in the early stages. It is often associated with fears of permanent paralysis or ill-health. Tremors of the limbs are common. Patients are extremely sensitive to noises. Cerebration is slow. Memory is defective; in the more severe cases even for remote events. Affections of the special senses are common soon after the accident, but seldom persist long. Definite nystagmus is rare; nystagmoid movements are not infrequent. Insomnia is at first the rule, and sleep is disturbed by terrifying dreams. In some of these cases there is a more defined loss of power, either hemiplegic or paraplegic. As a rule there is at first more or less general loss of power of all the muscles of limbs and trunk. In all cases electrical reactions were normal; the results in the hemiparetic cases were good. Treatment by rest, good feeding, massage, passive movements, and exercises. The leg in all cases recovered before the arm.

Incoordination is present in some cases. The deep reflexes are usually exaggerated. Sphincters unaffected.

Considering the cases as a whole, Dr. Michell Clarke concludes that the pathological changes must be widely distributed through the nervous system. "The disturbance affects the highest cortical levels, the middle levels with the subconscious mechanisms for every-day activities, the motor centers in the cord with their issue in the final common path, and the muscles themselves, and often also the afferent paths and the receptive apparatus for localization and the components of deep sensibility." There is possibly a block in the passage of nervous impulses from one neuron to another, and this may be due to an alteration in the constitution of the terminal ramifications of the axones and the dendrites. The disorder of voluntary movement may be explained by an overaction of the cerebellum, or by the want of counteraction of the cerebellum owing to the impulses from the cerebrum being in abeyance.

Cases of conscious simulation of nervous disorders have been conspicuous by their absence; the influence of fear is not so great nor so lasting as might have been anticipated. In a few cases, however, the fear of returning to the front does retard recovery; where, therefore, there is no prospect of his return to active service the patient should be so informed—*Jour. of Mental Science.*

THE MALINGERER: A CLINICAL STUDY.—Bernard Glueck, *International Clinics*, V. 3, series 25, writes that there is a gradually gained conviction that malingering and actual mental disease are not only not mutually exclusive phenomena in the same individual, but that malingering itself is a form of mental reaction manifested almost exclusively by those of an inferior mental make-up, and cases of pure malingering in normal individuals are rare.

Further, malingering, as well as lying and deceit, far from being a form of conduct deliberately and consciously selected by an individual for the purpose of gaining a certain known end, is in a great majority of instances wholly determined by unconscious motives, by instinctive biologic forces over which the individual has little or no control. This makes differentiation between the genuine and malingered symptoms in a given case very difficult.

In the last analysis, malingering is a special form of lying. It appears to certain individuals as the only possible means of escape from and evasion of a stressful and difficult situation.

The transition from absolute health to distinct mental disease is never delineated by distinct landmarks but shows any number of intermediary gradations. To state definitely where normality leaves off and disease begins would be impossible. However, legally, no intermediary stages between mental health and mental disease are permitted—an individual must be sane or insane.

In malingering we see the application of deceit and lying to a definite situation. The malingerer aside from being a malingerer is worthless mentally, and this mode of reaction is at times resorted to by individuals who had always been looked upon as being far from incompetent, which proves that under special stress, especially mental stress, men readily sink to a lower cultural level and resort to the defensive means common to this level.

Clinically, malingering is to be considered from three distinct viewpoints:

1. Malingering in the frankly insane;
2. Malingering in those apparently normal mentally; and
3. Malingering in that group of borderline cases which should rightly be looked upon as potentially insane and as constantly converging upon an actual psychosis.

It may be difficult for the lay mind to appreciate that an individual may be suffering from an actual psychosis and at the same time malinger mental symptoms. The frankly insane at times manifest conduct which, taken by itself, differs in no way from normal conduct, and the so-called normal individual at times exhibits a type of reaction which is essentially of a psychotic nature.

The conclusions which may safely be drawn from the study of malingering as it is manifested in criminal departments of insane hospitals are as follows:

1. The detection of malingering in a given case by no means excludes the presence of a mental disease. The two phenomena are not only not mutually exclusive, but are frequently concomitant manifestations in the same individual.
2. Malingering is a form of mental reaction manifested for the purpose of evading a particularly stressful situation in life, and is resorted to chiefly, if not exclusively, by the mentally abnormal, such as psychopaths, hysterics, and the frankly insane.
3. Malingering and allied traits, viz., lying and deceit, are not always consciously motivated modes of behavior, but are not infrequently determined by motives operative in the subconscious mental life, and accordingly affect to a marked extent the individual's responsibilities for such behavior.
4. The differentiation of the malingered symptoms from the genuine ones is, as a rule, extremely difficult, but great caution is to be exercised in pronouncing a given individual a malinger.—*Journal of Mental Hygiene.*

THE PSYCHONEUROSES OF WAR.—J. Grasset, *Medical Press and Circular*, Lond., and Dr. W. A. Turner, writing separately in the *British Medical Journal*, under date of May 15, 1915, on "Cases of nervous and mental shock observed in the base hospitals in France," Dr. Grasset describes deaf-mutism (occasionally, but less frequently, blind deaf-mutism) as one of the clinical surprises of the great war. These cases are caused by the explosiion of big shells in close proximity to the patient. The shock is both physical and mental. "A typical instance is the bursting of a shell at close quarters by which a soldier is hurled several yards through the air and more or less completely buried beneath earth or the bodies of his comrades. He loses consciousness, and on recovery, especially if he be in an emotional or overtaxed condition, finds that he can neither see, hear, nor speak. . . . He is unable either to convey or receive impressions."

Dr. Grasset suggests, as an explanation of the psychology of these cases, that these patients probably think that they have died, as the only thing which unites such a patient to existence is the preservation of his sensibility and sense of movement. The remarkable example is cited of an ingenious nurse who placed a pencil in the hand of one of these blind deaf-mutes, and guided it while she wrote a question on a piece of paper. The patient replied to the question, writing the answer in a firm round hand. "In these cases sight usually returns first, hearing next, and speech last of all. Both sight and hearing may suddenly return."

Among the less interesting psychoneuroses produced by shell shock are traumatic neuroses, the most important clinical manifestation of which is hemiplegia, or, rather, anesthetic hemi-impotence; hysteria, neurasthenia, disturbances of sleep, and changes in character, as well as various psychoses. The opinion is expressed that personal and hereditary antecedents (ante bellum) have comparatively little value in the psychoneuroses of war, but that in the etiology of the psychoses the personal and hereditary elements play infinitely the more important rôle.

Out of 193 cases of traumatic lesions of the nervous system examined by Dr. Grasset during the first three months of his service, fifty-nine cases of psychoneuroses were found.

It is stated that the marked psychoneuroses are not as a rule provoked by the graver injuries. "The origin is more dramatic. The explosion of a bursting shell which hurls the victim three or four yards through the air and frequently buries him beneath corpses and débris; the explosion of a shell in the trenches in his immediate vicinity by which the comrades at his side are killed, men who are perhaps breakfasting with him; an explosion which kills a comrade and perhaps hurls the lifeless body at him; the impact of a projectile which bruises and stuns without actually wounding him; these are the originating causes of the psychoneuroses of war. . . . When the victim recovers consciousness, which he does sooner or later, he finds that he is paralyzed. He thinks that he has lost one of his limbs. He is blind, deaf, and dumb, or he is in a shattered and anxious mental condition." . . . The number of patients suffering from mental disease is bound to be greatly increased as the war continues. War conditions "try men's souls" probably more than any other human experience. Psychoses and psychoneuroses are certain to claim a tremendous toll as one of the aftermaths of war.—*U. S. Naval Med. Bull.*

WHAT IS A "SPEECH CIRCLE"?—Walter B. Swift, *Jour. of the National Education Ass'n,* summarizes as follows: The speech circle consists of three individuals with three functions, viz., superintendent, doctor and teacher; supervision, diagnosis and treatment.

OTHER FORMS OF SPEECH IN TABES.—Walter B. Swift, *Proceedings of the American-Medico-Psychological Association,* April 4-6, 1916, reports two cases of tabes which show the speech sign in form differing from that reported last year. One case shows slowness and frequent elision of sounds that require exact muscle coordination; the other shows a pervasive slovenliness. The previous report (1) of the sign is confirmed. And the method reported (2) for a technique of elicitation found applicable.

SYPHILIS OF THE NERVOUS SYSTEM IN SOME OF ITS CLINICAL AND PATHOLOGICAL MANIFESTATIONS.—W. G. Spiller, *American Journ. of Mental Sciences,* writes that in tabetic ocular palsies the lesion is not primarily nuclear; but is in the nerve fibers as they leave the brain. The author is not prepared to state a conviction that primary nuclear palsy of the cranial nerves in tabes is impossible, but does believe that most tabetic cranial nerve palsies are primarily radicular, and that when nuclear changes are found in tabes they occur in cases of long standing. It is to be expected that when nerves have been degenerated near their nuclear origin during a period of years the nerve cells from which these degenerated fibers arise should show alteration. This viewpoint is of therapeutic, as well as pathologic, importance, for if the degeneration be in the nerve, we may expect recovery from persistent antisyphilitic treatment, provided the degeneration be not too intense and the treatment be begun early; whereas we may expect much less improvement if the cells of the origin be primarily affected. There are cases in which syphilitic ocular palsy is not caused by basal meningitis but softening implicating the nuclei or nerve fibers of the affected nerve. It is desirable to remember that permanent results were accomplished in the treatment of nervous syphilis in some cases before the days of salvarsan and the modern laboratory methods of investigation. Unfortunately, we must confess that our modern methods, while usually of great value, are not satisfactory in all cases of nervous syphilis, and that some cases do not respond to any treatment, and others may respond and then relapse. Syphilis affects not only the outer covering of the brain but also the lining of the ventricular spaces, and may produce intense lesions here. Proliferations of the ependyma may be great, and the aqueduct may be occluded in the same way as frequently is one of the brain arteries, and in this manner hydrocephalus may result. Epilepsy is definitely caused at times by acquired syphilis, and it may be possible to trace the relation of cause and effect. In other instances of epilepsy the syphilis remains unrecognized. The Wassermann reaction may be negative, as it frequently is, when syphilis of the nervous system is of very chronic type.—*American Journal of Syphilis.*

EFFECTS OF HIGH EXPLOSIVES UPON THE CENTRAL NERVOUS SYSTEM.—Frederick W. Mott, in his Lettsomian Lectures, *Lancet*, Lond., 1916, discusses the subject in three subdivisions, namely: Functional Neuroses and Psychoses; Noxious Gases, and Symptomatology of Shell-Shock.

Functional Neuroses and Psychoses.—The production of functional neuroses and psychoses in a soldier is greatly favored by a neurasthenic condition, whether from a tendency inherited or acquired from the stress of wartime experiences.

The effects of high explosives upon the central nervous system may be divided into three classes. 1. Immediately fatal, either from wounds caused by shell, rocks, etc.; or the person may be buried from the explosion of a mine. Sometimes instant death has occurred in groups of men from the effects of shell fire, yet no visible injury has been found to cause it. 2. Cases in which the detonation of high explosives has caused injuries to the body, including the central nervous system, that have not been immediately fatal. "The number of these cases which do not exhibit any of the functional disorders and disturbances characteristic of what is termed 'shell-shock' without visible injury, although such individuals have received most serious and fatal wounds from exploding shells, leads one to consider that in a large proportion of cases of shell-shock without visible injury there are other factors at work in the production of the nervous symptoms besides the actual aerial forces generated by the explosive." 3. The third group includes injuries to the central nervous system without visible injury. This may happen through direct aerial compression, or by the force of aerial compression throwing the soldier into the air or against the side of the trench, or by blowing a wall or roof down on to him, causing concussion; or by his being hit on the head or spine by a sandbag. Also, he might be buried and partly asphyxiated, or suffer from deoxygenation of the blood through CO poisoning, of which high explosives contain so great a quantity.

When enormous aerial compression is generated, the ordinarily incompressible and hence protective character of the cerebro-spinal fluid is altered, and it is probable that the compression is transmitted to the fluid about the base of the brain, causing shock to the vital centres of the floor of the fourth ventricle, resulting in instantaneous arrest of the functions of the cardiac and respiratory centers. Lord Sydenham concludes that the forces generated are sufficient to cause instantaneous death. It has been estimated that the sudden atmospheric depression in such cases corresponds to a dynamic pressure of about 10 tons to the square yard. "One effect of this is to liberate nitrogen suspended in the blood and transform it into bubbles of gas which are driven into the capillary vessels and cause instant death." A shock of sufficient intensity would also make itself felt in all the neurons composing the central nervous system. Through anatomically and functionally correlated neurons, shock affecting one part of the nervous system may be transmitted to remote parts. "In hemorrhage into the internal capsule, we have a sudden irruption of blood cutting through the pyramidal efferent system of fibers, resulting in a flaccid paralysis of the opposite limbs." A case of hemianopsy, caused by a bullet wound of the skull, resulting in complete blindness, but not deafness, is described as another example of temporary dissociation by shock. This temporary dissociation by shock of anatomically and functionally correlated systems of neurons has been termed diaschisis.

The writer then describes in detail the physiological effects of shock upon the living neuron. The results of these effects may be not only dissociation of the cortical perceptor neurons, producing unconsciousness or a disturbance of consciousness, but for a varying period of time destruction of the power of recollection of perceptions prior to the shock, of the power of recognition, and even complete loss of consciousness of the external world.

An essential for consciousness is a continuous supply of oxygen through the capillary system to the intercalary neurons, otherwise they cease to function, causing dissociation. Any violent emotion affects the vasomotor center and heart's action, causing a fall in blood pressure and so producing an immediate lowering of oxygen tension in the fluid. This causes suspension of function of the intercalary neurons of the cortex, followed by dissociation of the cortical perceptors and loss of consciousness.

"The symptoms of headache, weariness, loss of power of concentration, irresolution, and mental fatigue constituting a neurasthenic condition so frequently found as a result of shell-shock may be explained by the habit of drawing on the reserve of neuro-potential, and being unable through insomnia or sleep disturbed by terrifying dreams, worry and anxiety to restore the balance and return to the normal conditions of automatic renewal of nervous energy as fast as it is used. Physical shock accompanied by horrifying circumstances, causing profound emotional shock and terror, which is contemplative fear, or fear continually revived by the imagination, has a much more intense and lasting effect on the mind than simple shock has."

This subject is concluded with a description of the nature of high explosives and forms of projectiles, and a discussion of theories regarding causation of instantaneous death of groups of men.

Noxious Gases.—"Many of the symptoms of CO poisoning are similar to those which I have observed in shell-shock with burial. It must not be supposed that in poisoning by illuminating gas or CO poisoning recovery is always complete, nor that the mental symptoms are always only of a transitory nature. It often takes months for the effects of the poisonous action of CO on the heart and nervous tissue to wear off, and in certain cases the damage is permanent."

The first decided symptoms occur when the blood is saturated with about 30 per cent. of CO; with every degree of saturation up to 50 per cent. dangerous symptoms increase until the loss of power and staggering prevent escape. Even after prolonged exposure to .1 per cent. of CO recovery is possible; with .2 per cent. loss of consciousness and power occur and in course of time death ensues; exposure to .3 per cent. proves rapidly fatal. As the gas has no odor, soldiers would be unaware of its presence, and lying unconscious or buried in a trench which was being heavily shelled, they might easily be poisoned by the gas without knowing it.

The symptoms of CO poisoning are "headache, which may take the form of distension of the head without pain, ringing in the ears, interference with vision, which may become indistinct and blurred, hallucination of sight and even blindness, giddiness, especially on exertion, powerlessness, yawning and weariness, often vomiting, shivering and feeling of cold, palpitation of the heart, and a feeling of oppression in the chest. . . . When men affected regain consciousness they appear dazed and stupid, and generally have no recollection of what happened. There is mental confusion, and they seem to have no power of concentration of thought, and they are unable to answer questions properly. Indeed, some of them look as if they were recovering from a drinking bout. The slightest anxiety or excitement will bring on a return of the symptoms complained of, such as tightness or oppression in the chest, palpitation and various pains and feelings of distress about the head while beads of perspiration may appear on the forehead. . . . Persons with a nervous predisposition . . . are more susceptible to the effect on the nervous system."

A very important derangement of the mind in CO poisoning is loss of memory. This may be characterized by intense retrograde amnesia together with loss of recognition. Sometimes a whole period of time is erased from the mind. Other symptoms are speech disturbances. The power of speech may be lost for some time or it may come back after many days. In some cases there is difficulty in uttering words, as though it required great effort to speak on the part of the patient. There is often repetition and reiteration of words and phrases. When this affection is of long duration, there are usually other mental symptoms. Tremors frequently occur. "These symptoms so accord with those functional disorders of the central nervous system which have so frequently been found to occur in shell-shock with burial that one naturally thinks it possible that while lying unconscious at the bottom of a trench or dug-out sufficient CO is inspired to cause these severe effects on the mind which some of these cases exhibit."

The writer next discusses histological changes in the brain in CO poisoning, shell-shock, and spinal concussion. Three cases are reported for illustration. Reproductions are given of photographs and photomicrographs, showing hemorrhages and cell disturbances of the brain from the above-mentioned causes.

There may be also poisoning by oxides of nitrogen. This, however, acts more as an irritant on the respiratory passages, causing pneumonia. Pneumonia may also supervene in CO poisoning.

The similarity of symptoms and histological changes in the brains of persons who have died from CO poisoning and those who have died from shell-shock with burial suggests the desirability of examining the blood during life for CO poisoning in severe cases of shell-shock without visible injury and where burial has occurred, especially if some time has elapsed before excavation.

The writer then gives a brief recapitulation of the possible effects of the detonation of high explosives on the nervous system in cases where there is no visible external injury. These are:

1. Commotion from the aerial compression.
2. Concussion with or without burial.
3. Decompression with embolism, by bubbles of N and CO^2.
4. Inspiration of CO during the aerial compression.
5. Prolonged inhalation of noxious gases while lying unconscious or partially buried.

"The mental and bodily conditions of the individual at the time of the shock may be classified as follows: 1. Inborn: (a) Timorous disposition and anxious temperament; (b) Neuropathic or psychopathic inheritance. 2. Acquired: (a) Locus minoris resistentiae in the central nervous system in consequence of alcoholism, syphilis, or previous head injury; (b) Lowered neuro-potential, the result of a post-febrile neurasthenia; (c) Nervous exhaustion, the result of mental stress, anxiety, insomnia, and terrifying dreams; (d) Bodily exhaustion from fatigue, cold, wet and hunger.

"A large majority of the cases of so-called shell-shock admitted with functional neurosis in some form or other occurred in individuals who either had a nervous temperament or were the subjects of an acquired or inherited neuropathy. In a certain number of cases the cumulative effect of active service, often combined with repeated and prolonged exposure to shell fire and projectiles containing high explosives, had produced a neurasthenic or hysteric condition in a potentially sound individual. Some of the worst cases have occurred in soldiers and non-commissioned officers of years' standing—men of excellent physique who have led active lives without any evidence of a nervous breakdown; some, indeed, have fought in the South African War, and in this campaign had been in many battles and engagements without previously exhibiting any neurasthenic symptoms, but at last the nervous system gives way. Such men have not, as a rule, succumbed from a single 'shell-shock,' unless it was one of the big 'Jack Johnsons,' but only after a third or fourth, and when they have been run down with the stress and anxiety of continuous apprehension and dread of the enemy surprising them. On the other hand, there are the more or less rapid breakdowns who give usually a history of either previous head injury, or of a nervous breakdown in ordinary life, or after some special stress indicative of a nervous temperament of a neuropathic disposition. Among the large number of officers I have sent back on account of neurasthenia, a considerable number associated with shell-shock, I have not observed a single case of functional paralysis or mutism."

This subject is concluded with a discussion of epilepsy as influenced by shell-shock. Brief details are given of 25 cases returned from the front and treated by Dr. Mott. His opinon is that "cases which were said to have developed epilepsy as a result of shell-shock were, generally speaking, individuals whom it might fairly be assumed were either epileptics or potential epileptics prior to the shock."

Symptomatology of Shell-Shock.—The symptoms of shell-shock as regards degrees of effects on consciousness may vary from a slight temporary disturbance to complete unconsciousness, with stertorous breathing continuing till death. Sometimes the men wander away from the trenches and are found in a dazed condition unable to account for their actions or to recollect how they came there. This condition is not unlike the fugue or automatic wandering of the epileptic.

The author next discusses amnesia as a condition resulting from shell-shock. Four cases are cited, in three of which music and songs familiar to the patient were used to arouse the power of recollection.

Psychic trauma and the effects produced by terrifying dreams are illustrated by reports of several cases.

Various forms of speech defects are common: mutism, aphonia, stammering, stuttering, and verbal repetition. The most frequent is mutism. Various cases are cited, in many of which cure was effected through a surprise or shock of some kind. The pathogenesis of mutism is described in detail and opinions of various authorities cited.

Headache is one of the most common symptoms associated with shell-shock. With recovery of consciousness this tends to become acute. The commonest situation for the maximum pain is the occipital region and the back of the neck. The pain is variously described as burning, stabbing, or a heavy, dull, dizzy feeling, a feeling like a tight hat or a red-hot wire being run through the temples. It is worse at night, and seems to be correlated with thoughts of terrifying scenes and is increased when the mind tries to thrust these aside, or with any effort to concentrate.

Cardiac and vasomotor disturbances are palpitation, breathlessness on exertion, and praecordial pain. There may be physical signs of dilatation and tachycardia. The pulse is often small and increased in frequency; the blood pressure is never high. The hands are frequently blue or mottled and cold, with a clammy sweat of the palms. Surface temperature may be very low. The temperature of the hands varies according to the temperature of the room.

Cutaneous and deep sensibility of the body may be affected, or, in severe cases, sometimes loss of skin sensibility to all forms of stimulus, and also of deep sensibility are found. The extent and degree of this loss of sensibility is variable. Hyperesthesia is more common than anesthesia.

Hearing is often completely lost, frequently together with speech, so that there is a condition of functional deaf-mutism. Sometimes a man is deaf on one side only, from a ruptured tympanum or from wax driven forcibly against the drum. Auditory hallucinations are common, and hyperacusis is frequent, exciting the patient's nervous condition and aggravating headache.

Sight may be seriously affected during the acute stage, but it is commoner for the patient to complain of "smoky vision." Failure of accommodation and sluggish reflex are not uncommon in acute stages. Occasionally there is diminution of the visual fields. Some cases of photophobia were met with, but this is usually due to gas or irritating substances in the eye. This was often associated with blepharospasm.

A few cases of functional blindness have been treated. Loss of sight, hearing and speech is sometimes associated with acute hyperesthesia.

Tremors are very common and constitute a serious disability. They may be coarse or fine, general or affecting only parts of the body, continuous during the waking state or absent during sleep. Most often they are rhythmical coarse tremors like those of paralysis agitans. A true functional tremor may be distinguished from a malingerer's tremor by making the patient count slowly and quickly. If the rhythm remains unaltered the tremor is truly functional. A case of functional tremor completely cured by suggestion is cited.

Various tics, which may, however, have existed prior to the war, have been observed. Choreiform movements, probably due to unconscious imitation of other patients, have been noted.

Functional paralyses are frequent, the most common being paraplegia, but hemiplegia and monoplegia are also found. Suggestion of injury often plays an important part in causing and maintaining a fixed idea of paralysis.

There are many different gaits. There are a refusal to walk, dancing tremor as if the legs were on springs, slow shuffling with feet wide apart, dragging the soles of the feet, and a gait assumed by patients who have been allowed to think they have to be supported by two sticks in order to walk, causing a persistent leaning forward, sometimes amounting to a complete bending double of the body. In such cases the supports should be taken away at once.

"Be cheerful and look cheerful is the note that should ever be sounded to these functional cases. Sympathy should not be misplaced although it should be shown to all these poor fellows who have a fixed idea of never recovering; it is not their fault, it is a real thing to them, and no one could be more grateful than these cases of functional nervous disability for cheery words. I use many of these cases that have recovered as object-lessons. I do not find hypnosis or psychoanalysis necessary or even desirable; only common-sense and interest in the comfort, welfare and amusement of these neurotic patients are necessary for their recovery. The conditions at Maudsley Hospital will be all that can be desired. There are light airy wards, and day rooms for meals and recreation, plenty of single rooms for the isolation of cases that are troubled with noises or require special attention; and especially valuable are the baths, so that every soldier can get a warm or cold spray every day. The warm baths, and especially the continuous warm baths, of which there are eight, are especially valuable for promoting the action of the skin, of relaxing the tired muscles, and by their soothing influence helping to induce sleep, so that less hypnotics are required to be employed.

"Diversion of the mind from the recollection of their terrifying experiences is essential for successful treatment. This can be best accomplished by the provision of every form of healthy indoor and outdoor amusements—*e. g.*, books, games and music. These are better in a recreation hall where convalescent patients can enjoy themselves. I have alluded to the hypersensibility of many of these patients to sounds, consequently neither gramophones nor billiards should be within the hearing of these acute cases. The out-patients' waiting-room will be utilized at the Maudsley Hospital for recreation. . . ."—*Mental Hygiene.*

EARLY RECOGNITION OF POLIOMYELITIS.—Royal Storrs Haynes, *Arch. Pediat.*, 1917, XXXIV, 401, claims that the hysteria of the summer of 1916 on the part of the general public was due in part to the cry of total ignorance of the disease on the part of the medical profession. We probably know as much or more about poliomyelitis than scarlet fever. The disease has proven to be infectious. Various studies of Flexner, Lewis, Clark, Noguchi and other Americans have established the identity of the infecting organism and with it fulfilled Koch's postulates. Points of ingress in the human body and its distribution there have been discovered, also the lesions caused in the viscera and central nervous system. It has also been discovered that the egress of the infectious material from the body is through the nasal mucous and intestinal tract, that insects may be passive carriers and healthy human beings may transmit the disease. The fact is definitely established that it travels along lines of human contact, animals and insects being only passive conveyors of the infectious material.

Attention is directed especially to the two humped course of the disease. The first hump represents the period of incubation and early symptoms, lasts two or three days. Then comes a latent period, then the second hump or period of invasion of the central nervous system. For the sake of early instituting the treatment and isolating the victim, an early diagnosis is most imperative. It is most important to regard any illness of the child in summer, however slight, as a possible early stage of poliomyelitis; to protect such a child from fatigue or injury during the 3 or 4 days immediately following the subsidence of this illness; and to continue careful observation.

In the preparalytic stage the following symptoms may be noted: (a) General constitutional disturbance, fever, accelerated pulse, anorexia, prostration. (b) Pain and hyperesthesia. (c) Symptoms referable to irritation of spinal cord, as stiff neck, Kernig's sign, alteration of reflexes, tremors, fibrillary twitchings of muscles, paresis of certain groups. (d) Symptoms referable to irritation of basal ganglia and cranial nerves, as difficulty in swallowing, facial paralysis. (e) Dullness, drowsiness or excitement or convulsions.

The one outstanding symptom is the hyperesthesia. The child cries out when touched. Also the pain upon anterior flexion of vertebral column is a constant early sign.

The spinal fluid is usually clear—but may be hazy, and is under slight tension in first 12 to 24 hours. Cells of mononuclear type are abundant. Albumin and globulin are present and the fluid is negative bacteriologically.—*Cleveland Med. Jour.*

PROGRESSIVE ATROPHY OF THE GLOBUS PALLIDUS.—J. Ramsay Hunt, *Brain, London,* 1917, XL, 58, from a clinical and pathological study of four cases belonging to the paralysis agitans type and a study of the literature on the subject, arrives at the following conclusions concerning the physiology of the corpus striatum:

"*Physiological.*—The corpus striatum is the great infracortical centre for the control and regulation of automatic and associated movements. It is composed of two cellular systems, viz., the small ganglion cells of the caudate nucleus and putamen (neostriated) and the large motor cells of the globus pallidus mechanism (pallidal). The function of the neostriatal cells is inhibitory and co-ordinating; that of the pallidal cells is motor.

Loss of the small-cell inhibitory system is followed by chorea; loss of the large-cell motor system by the paralysis agitans syndrome, viz., rigidity, tremor, and disturbances of automatic and associated movements.

A destructive lesion involving both types of cells in the caudate nucleus and putamen (the etat marbre) produces the Vogt syndrome of the corpus striatum, viz., spastic diplegia with athetosis, rhythmic oscillations and pseudobulbar palsy. A massive lesion of the whole corpus striatum as in progressive lenticular degeneration produces the Wilson syndrome, viz., tremor and rigidity of the paralysis agitans type, together with tonic and clonic spasms and occasionally choreic and athetoid movements (Grower's tetanoid chorea).

The Vogt syndrome and Wilson's syndrome therefore represent different degrees of involvement of these two cellular systems. The occurrence of muscular rigidity, rhythmical tremor, chorea, athetosis, tonic, clonic and mobile spasms will depend upon the distribution and involvement of these two cellular systems.

Athetosis, therefore, is simply a combination of chorea and rigidity from simultaneous destruction of the smaller (inhibitory) and larger (motor) cell types of the neostriatum.

The globus pallidus mechanism is the motor nucleus of the striate body and through its connections with important centers in the hypothalmic region, viz., the nucleus ruber, corpus subthalamicum and substantia nigra—exercises a controlling influence upon the segmental nervous system through the medium of the extra-pyramidal motor tracts. The corpus striatum has also close relations with the cerebral cortex, the cerebellum, and the peripheral sensory mechanism, through its connections with the great sensory correlating station, the optic thalamus.

The cells of the globus pallidus type, therefore, occupy the same position in the extra-pyramidal motor system as do the motor cells of the cerebral cortex in the corticospinal system; the globus pallidus mechanism controlling automatic and associated movements, whereas the higher cortical centres are concerned with isolated synergic movements.

Both of these mechanisms, in addition to the function of motor innervation, have also a controlling or inhibitory effect upon muscle tonus, so that a destructive lesion of either has as a result paralysis of a special type plus an increase of muscular tonus. A lesion of the pyramidal tract system is followed by the phenomena of spastic paralysis; a lesion of the pallidal system by the phenomena of paralysis agitans.

Three fundamental types of motor palsy may therefore be recognized; two are central and one is peripheral:

(1) A spastic paralysis of cortical origin—from involvement of the first or central motor neurones.

(2) A paralysis agitans of pallidal origin—from involvement of the motor neurones of the globus pallidus mechanism.

(3) An atrophic paralysis of peripheral origin—from involvement of the second or peripheral motor neurones."—*Cleveland Med. Jour.*

NEURO-ETIOLOGY.

THE ETIOLOGY OF MONGOLIAN IMBECILITY.—Charles Herrman, *Arch. of Ped.*, discusses the various theories of Mongolianism which has puzzled scientists for years.

Worry, emotional shock, and diseases of the mother during pregnancy have always been popular theories which help, especially the laity, to explain the occurrence of their unfortunate issue. No scientific data, however, is obtainable to substantiate such theories.

Immaturity or exhaustion of the generative organs, especially of the mother, is another theory rather popular with the profession. A certain percentage of the mothers of mongols are very young or very old. In about one-third, the mother is over 40 years old. However, there remain the two-thirds in which the mothers are between 20 and 40. Large numbers of perfectly normal children are born to mothers over 40, and there is no evidence to show that such children are usually weaker physically and mentally than those of preceding pregnancies.

There may have been pressure on the basal ganglia, as shown by the short antero-posterior diameter of the skull, the flat occiput, and the diminished weight of the cerebellum, pons, and medulla. The primary factor is not the deformity of the skull, but the incomplete development of the brain.

Congenital syphilis is considered a strong etiological factor with many observers, but the consensus of opinion is that syphilis is not responsible for the great majority of cases.

The most suggestive evidence concerning the cause of mongolian imbecility is a unit character and recessive, following the Mendelian principles. A number of charts are shown by Dr. Herrman to illustrate and substantiate this theory. He concludes that there is no positive proof that worry, emotional shock, illness during pregnancy, or congenital lues are important factors in the causation of mongolian imbecility. The evidence that the condition is a unit character and recessive, although not conclusive, is certainly suggestive.—*Virginia Med. Semi-Monthly.*

ON THE NATURE OF NEUROPATHIC AFFECTIONS OF THE JOINTS.—L. Bloesser, *Annals of Surg.*, LXVI, 2, was able to produce experimentally neuropathic joints—typical Charcot joints. His work was done on cats, a total of 69 animals being used. Many of these were observed for a period of from a few weeks to three or four years.

In order to simulate the conditions in tabes the posterior roots leading to an extremity were severed on one side; the opposite side being used for control. Complete analgesia, anesthesia and ataxy resulted in the affected extremity. Sections of the cords of such animals showed ascending degeneration of the posterior columns. In a series of 38 animals where previous posterior root resection had been done, fractures and disintegration of tarsal and metatarsal joints occurred in 14. Eight of these joints showed destructive arthritis and periarticular ossification typical of Charcot's joints. In each instance there was evidence of previous fracture into or near the affected joint.

Chemical investigation comparing a bone from the enervated side with the healthy, showed no change in composition. Comparative tests of the tensile strength similarly showed no difference. This investigation tends to disprove Charcot's theory that trophic disturbances cause a wasting in the bone—osseous atrophy.

The author hence doubts the existence of trophic nerves.

In six animals a deforming arthritis was primarily produced with the thermocautery. Following complete healing of the wounds unilateral root resection was done. One animal developed a typical Charcot knee.

Conversely, in three animals resection of the posterior roots was done primarily; a few weeks later the knee joints were traumatized with the thermocautery. Within three weeks every one of the cats developed a Charcot joint. The essential point is that these animals (in whom posterior root resection is done) lose their protecting sense of pain. It was observed that the more active animals, as a rule, developed bone or joint trouble, just as in tabes the Charcot joints develop during the early stage.

The author concludes that "trauma and lack of the warning sense of pain are the cause of most tabetic bone and joint lesions."—*The St. Paul Med. Jour.*

THE BACTERIOLOGY OF POLIOMYELITIS.—H. Greeley, *Jour. Lab. and Clinical Med.*, 1917, 11, 671, from very careful bacteriological studies, concludes that the organism of poliomyelitis belongs to the same group as the organisms causing distemper in animals. Both give rise to similar clinical symptoms, but in the former paralysis is common, while in the latter it occurs only in about 5 per cent. of cases. From cultures taken from a fatal case of poliomyelitis the author obtained a pleomorphic bacillus which caused paralysis in cats, dogs, rabbits and guinea pigs and, in an accidental passage through the experimenter, gave rise to abortive symptoms of the disease. Cultures taken from the nasal pharynx of the author produced paralysis in a rabbit and nerve lesions in guinea pigs.

The organism is saprophytic and grows very well in summer heat, this accounting for the prevalence of the disease during hot weather. It forms spores which resist the process of pasteurization.

While contact cases of poliomyelitis may occur either by direct transmission of the germ from animal to man, or man to man, the great mass of cases which comprise epidemics are caused by milk borne contagion. It seems probable that cows are "carriers" of the infection.—*Cleveland Med. Jour.*

NEURO-THERAPY.

Nerve-Shattered Soldiers and Their Treatment.—Dr. Lumsden, in *The Times*, believes that soldiers suffering from functional and curable nervous disease, disease that is eminently amenable to treatment, but to which treatment in hospital is not appropriate and not likely to be successful, should be "boarded out" in country homes, in gardeners' cottages, on farms, and in similar places. The suggestion is a good one for many reasons. These cases, as has been said, are not suitable for hospital treatment. The hospital atmosphere, the atmosphere of invalidism, sickness, and incapacity, is not good for them. Their minds are in a morbid state, they are introspective and amenable to suggestion, and are very likely to reproduce the symptoms that they witness exhibited by those around them. They reinforce and corroborate one another's feelings. The hospital is almost a forcing house of symptoms. It is important for their recovery that they should be separated from other patients suffering in the same way, and should live amongst healthy people. At the same time, their own homes are by no means appropriate places for such patients. Here they are the objects of too much solicitude, and receive too much sympathy and assistance; and thus form habits that tend rather to the confirmation and fixation of the nervous condition than to its recovery. The best human surroundings for them are not those of invalids like themselves, or those of lavish interest and sympathy which increase their tendency to self-absorption, to introspection, to attention to their own symptoms, and to self-pity and self-interest, but rather the society of others who are too busy to make a study of them, of others who are absorbed in their own occupations, and whose interests are externalised on busy industry.

Great is the force of example. Especially great is it to the impressible, such as for the most part these patients are. If they are removed from the aimless and idle life of the hospital to surroundings in which every hand but their own is at work, and every interest but their own is thrown outward upon work to be done, their own interests can scarcely fail to be drawn out of themselves. Moreover, to very many of them there will be the interest of novelty. They have most of them been town-dwellers, and have never known the varied aspects of nature or the varied interests of country life. They will be introduced into a wider and more spacious horizon. They will view life from a new aspect. They will be tempted out of doors. Simple jobs within their capacities, interesting work, novel in kind, can be found for them. All the conditions of their lives will be curative.

The scheme includes the following features:

1. The patient is to be freed completely from the brooding horror of returning to the circumstances that have brought him to this pass. He is to be assured that his connection with the Army is forever broken.
2. The host who receives him incurs no responsibility for his health or recovery, but merely carries out instructions, which are of a simple character.
3. The pension is to be temporary, and may be reduced if it appears that the pensioner is not using every effort to get well.

4. He will receive his pension, but no pay for the work he may do. We are not at all sure that this is the best arrangement. Every possible incentive should be held out to the patient to put forth every effort for his own recovery, and there is little incentive to work if the work is unremunerated. That it should not be remunerated at its full value, we should agree; but we think it should receive some little remuneration calculated on its value. If this is not done, the pensioner will be apt to think that he is being exploited, a very unreasonable suspicion, no doubt, but such patients are apt to be suspicious; and the working classes are just now full of suspicion that they are being exploited by a treacherous and malignant monster called Capital.

5. Full instructions are to be sent to the hosts as to how the pensioner is to be treated, and both pensioner and host are to report progress once a month. We think this is not often enough. It should be once a fortnight, for the treatment is to last only three months. This period, we think, should be made elastic. Probably it will seldom be able to be diminished, but it may need in some cases to be increased in order to obviate the danger of a relapse. These, however, are details that can easily be adjusted.—*The Hospital.*

HYPERTHYROIDISM.—Henry H. Harrower, in the *American Journal of Clinical Medicine*, for April, remarks concerning the treatment of hyperthyroidism that its immediate treatment centers on the control of the heart's action, and this is accomplished most satisfactory by placing the patient at absolute rest in bed in a quiet room away from the numerous worries and noises of the home. Cold applications over the region of the heart and of the thyroid gland exert some beneficial effect. By far the most important remedy in his experience is the extract of the posterior pituitary lobe, which may be given by intramuscular injection daily in doses of a one-half to one mil. (c.c.) of the usual standard solution. He has had occasion to use numerous sedative remedies, and none have seemed to exert so particularly beneficial an effect as this organic therapeutic wonder-worker. The usual effect of these injections is the reduction of the pulse rate by from 30 to 70 beats a minute, while by its remarkable influence on so many functions it also favors the intestinal activities, as well as increasing diuresis. Whether the pituitary gland contains a principle that exerts an effect opposite to that of the thyroid gland (an antihormone) has not been established; still he is convinced that, clinically at least, pituitary therapy is as profitable an advance in the treatment of hyperthyroidism as is any measure suggested in the past ten years and deserves much wider application and study in practice. He believes the most fertile field for toxemia is the intestinal canal, and he as a routine treatment does not give purges by the mouth, but gives a series of oil enemata on three successive evenings. These consists of 5 or 6 ounces of any oil (cotton-seed, olive or almond) warmed to body temperature and injected with ordinary bulb syringe, being made by position and gravity to reach the large intestine. This injection is to be retained all night. If laxatives are prescribed, they must be of the gentlest-acting nature. To nutralize the alimentary toxemia he directs the drinking in 24 hours of at least three pints of water in which from 60 to 100 grains of sodium bicarbonate is dissolved, not drinking any within one hour before or three hours after meals. He frequently, too, gives about 30 grains of the combined sulphocarbolates a day. He calls attention to localized infections as a cause, and these should, of course, be attended to. The emotions and diet should be considered, and he believes 15 or more grains of pancreatin daily to be a useful adjuvant to treatment. He recommends also the treatment of Dr. Geo. Richter, which consists in the daily dose of 15 to 30 grains of the dessicated anterior lobe of the pituitary body. From an experience of this in 11 cases, he is convinced it is of value.—*Cleveland Med. Journal.*

A New Treatment for Paralysis Agitans.—Walter B. Swift, *Journal of the American Medical Association*, Dec. 16, 1916, reports a marked case of paralysis agitans treated with slow moving exercises taken for fifteen minutes three times a day, which resulted in (1) a general constant relief of bad feelings, (2) occasionally an hour of complete relief from all distressing symptoms, and (3) a quickly gained repose into sleep on retiring.

The treatment, though giving marked relief from intense suffering even to the point of recovering normal conditions for hours at a time, proves no cure, and the symptoms all returned when the exercises were omitted; but they showed improvement again when resumed, and also again gave relief.

The Treatment of Tabes.—L. M. Gaines, *Southern Medical Jour.*, observes that we feel justified in diagnosing tabes dorsalis now before the appearance of Romberg's sign, ataxia, or even disturbances of the deep reflexes. We realize, further, that it is precisely at such an early period in the development of the disease that we can favorably affect it by treatment. If, associated with the foregoing, we have a positive reaction in the cerebrospinal fluid, indicating a chronic syphilitis meningitis, together with such pupillary phenomena as anisocoria, pupillary irregularity or sluggish reaction to light, the diagnosis of early tabes is most probable. Added to the foregoing symptoms, the loss of the Achilles tendon reflexes establishes the diagnosis of early tabes, even in the absence of those signs which we usually associate with tabes: Romberg's sign, marked sensibility loss, absent patellar reflexes, and Argyll-Robertson pupils. It is in such an early stage of the disease that the most successful treatment can be instituted. Since the experience of many years appears to demonstrate the hopelessness of the disease, the introduction of a new therapy in the form of intraspinal medication, during the past few years, has been watched with the greatest interest. A method of treatment to stay the ruthless advance of so devastating a malady, which has hitherto resisted all treatment, is obviously of great importance. In the preparation of the serum given to the series of cases reported, the Swift-Ellis technic was followed except that the blood was withdrawn twenty to thirty minutes after the extravenous administration of salvarsan. Since prohibiting milk for some hours previous to treatment, the author has had much less severe reactions. Regarding the dangers of intraspinal treatment, when a careful observance of technic is followed, the procedure has proved safe. In all of the injections which the author has given, including those administered to the cases reported, no ill effects have been observed.—*American Jour. of Syphilis.*

INDEX.

The Alienist and Neurologist.

VOLUME XXXVIII. 1917.

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ORIGINAL CONTRIBUTIONS.

PAGE
Cerebral Excitation on the Male Sexual Glands, The Influence of 359
Chronic Alcoholic as a State Problem, The 416
Confusional States with Special Reference to Pathogenesis, Management of 29
Doctor in Court, The 408
Doctor, What is the Matter with the 167
Drink Problem, The Medical Side of the 160
Exhibitionism, The Psychology and Forensic Consideration of 239
Functional Nervous Disturbances of Quarternary Hereditary Syphilis 249
Goitre, The Treatment of 57
Heavenly Bridegrooms 121, 288
Heine-Medin's Disease 1
History of Psychiatry, Notes on 41, 147
Homosexual Problem, The 268
Hygiene of Children, Mental and Physical 423
Hysteria and Accident Compensation 60
Minor Ailments Potentially Important 21
Natural Instincts in Relation to Disease and Psychoses 432
Nervous and Mental Diseases, The Larger Problem Involved in the Etiology and Pathology of.. 393
Nervous Disorders, Latent Psychic Causes of 400
Neurasthenia 404

PAGE
Ophiophobia ... 311
Pillow as a Health Factor, The ... 439
Psychiatric Cases, Aspects in the Management and Therapy of ... 255
Psychiatry, Notes on the History of ... 41, 147
Quarternary Hereditary Syphilis, The Functional Nervous Disturbances of ... 249

SELECTIONS.

Clinical Neurology.

Bladder in Psychoses, Cystoscopic Examination of the ... 314
Central Nervous System, Phenomena upon Fatigue and Shock of, Observed at the Front in France ... 456
Cerebellar Tumors, Studies in the Localization of ... 77
Cerebral Syphilis ... 80
Cough, Reflex ... 77
Diffuse Brain Sclerosis, A New Familial Infantile Form of ... 180
Epilepsy, A New Psychic Treatment of ... 321
Explosives, Effects of High, upon the Central Nervous System ... 463
Fatigue and Shock of the Central Nervous System Observed at the Front in France, Phenomena Resultant upon ... 456
Generative Organs, Nervous and Mental Manifestations in Women in Relation to the ... 456
Globus Pallidus, Progressive Atrophy of the ... 468
Gunshot Wounds of the Peripheral Nerves ... 454
Headache, Ocular Causes of ... 85
Hypochondriasis, Sexual ... 322
Hysteria, Psychology in ... 316
Hysterial Mutism ... 79
Intestinal Stasis, Influence of, on the Nervous System ... 174
Little's Disease ... 178
Lumbar Puncture, Anxiety About the ... 326
Malingerer, The ... 460
Meningitis, Acute Syphilitic ... 85, 173
Meningitis, Cerebrospinal ... 323
Mental Deficiency in Children, The Wassermann Reaction in ... 175
Migraine, A Clinical Consideration of ... 86
Nervous and Mental Manifestations in Women in Relation to the Generative Organs ... 456
Neurasthenia and Psychasthenia ... 179
Neuropathic or Nervous Child, The ... 176
Neuroses of the War, Some ... 457
Neuroses, War and ... 323
Palsy, Peroneal, of Obstetric Origin ... 319
Paralysis, Brachial Plexus, A Case of ... 322
Peripheral Nerves, Gunshot Wounds of the ... 454
Poliomyelitis, Early Recognition of ... 467
Poliomyelitis, The Early Diagnosis of ... 451
Psychoneuroses of War, The ... 461
Red Nucleus Lesions, Case of ... 319
Sciatica, A New Sign of ... 75
Sclerosis, Disseminated ... 320
"Speech Circle," What is a ... 462
Speech Disorder, Studies in ... 78
Speech in Tabes, Other Form of ... 462
Stammering, An Outline of the Elements and Treatment of ... 75
Syphilis of the Nervous System in Some of Its Clinical and Pathological Manifestations ... 462
Voice Inheritance, The Possibility of ... 79

Clinical Psychiatry.

Arteriosclerosis and Its Relation to Mental Disease ... 345
Korsakow's Psychoses in Association with Malaria ... 347
Penal Institutions, A New Departure in the Treatment of Inmates of ... 345
Psychoneuroses, Psychoses and Mental Deficiency ... 344

PAGE
Somnambulism. 343
Spinal Fluid and Wassermann Tests in Psychiatry, Diagnosic Value of 347

Neuro-Diagnosis.

Barany Reaction as an Aid in Diagnosis and Treatment 187
Cerebellar Abscess 184
Cerebrospinal Syphilis, Study of the Cerebrospinal Fluid in 340
Dizziness, How to Diagnose the Cause of 181
Fracture of the Spine without Paralysis 186
Meningitis, Experimental Tuberculous 93
Poliomyelitis, Study of the Spinal Fluid in 92
Pressure Signs of Certain Intracranial Conditions Observed in the Fundus of the Eye 336
Sciatica, Diagnosis of So-Called 94
Sciatica, True and Simulated 183
Skull Fracture, Eye Symptoms in 337
Syphilis of the Nervous System, Diagnosis of 335
Wassermann Paradoxus 340
Wassermann, The Four Plus 336
Xanthocromia of the Cerebrospinal Fluid, Significance of 340

Neuro-Etiology.

Epilepsy, A Bacterial Infection, Is 192
Imbecility, Mongolian, The Etiology of 469
Neuropathic Affections of the Joints, On the Nature of 470
Poliomyelitis, The Bacteriology of 470

Neuro-Pathology.

Goitre, Relation of Mouth Infection in 96
Graves' Disease of Neurogenic Origin, Is 96
Spinal Fluid Syndromes of Nonne and Froin 193

Neuro-Physiology.

Cerebrospinal Fluid, The Possible Function of 88

Neuro-Therapy.

Alcoholism in Relation to Epileptic States and Epilepsy 331
Asthma, Results of the Psychic Treatment of Some Cases of 328
Asthma, The Treatment of 343
Cardiovascular Disease and Dementia Praecox, The Ductless Glands in 330
Hyperthyroidism. 472
Hyperthyroidism, Treatment of 332
Infantile Paralysis Treated with Immune Serum 329
Intraspinous Injections of Neosalvarsan Serum in Nervous and Mental Diseases 329
Nerve-Shattered Soldiers and Their Treatment 471
Neuralgia, Trifacial, Alcohol Injections in 87
Neural Syphilis, A New Method of Intraspinous Treatment with Mercury 328
Paralysis Agitans, A New Treatment of 473
Poliomyelitis, Acute, The Treatment of 195
Poliomyelitis, Anterior, After-Treatment of 194
Soldiers, Nerve-Shattered, and Their Treatment 468
Stuttering, The Rational Treatment of 197
Sydenham's Chorea, with Special Reference to Treatment 330
Syphilis, Modern Diagnosis and Treatment of 327
Tabes, The New Treatment of 473
Tabetic, A Plea for the 332
Thyroid Disease and Septic Tonsils 329
X-Rays, The Use of, in Hyperacidity of the Ductless Glands 343

Neuro-Surgery.

Neurotization of Paralyzed Muscles by Implantation of Motor Nerves 342

Psychiatry.

PAGE

Dementia Praecox ... 91
Endocrine Glands, The Rôle of, in Mental Disease ... 92

Psychology.

Animism, Psychology of ... 341
Fear, Psychology of ... 198

Psycho-Therapy.

Psychoanalysis ... 90
Stuttering, A Psychological Analysis of ... 89

EDITORIAL.

Alcohol and Other Narcotics, American Society for the Study of ... 221
Alienist and Neurologist ... 108
Cancer, Mortality from ... 111
Cancer, Resolution of the American Society for the Control of ... 224
Credit Bureau of the St. Louis Medical Society ... 105
Dairy Utensils, Unclean, Campaign Against ... 106
Dementia Praecox Problem, The State of Mind on the ... 351
German "Kultur," Chinese Object to ... 223
Laws Governing Criminal Procedures, Revision of ... 99
Love, What Is ... 224
McIntire Prize ... 108
Medical Examiners, National Board of ... 107
Medical Preparedness, Correlated Activities of the, etc ... 204
Medicine, New Fields of ... 349
Mental Hygiene, National Committee for ... 109, 222
Neurological and Psychiatrical Examination of Troops ... 356
Priesthood, The Wedded ... 223
Psychanalysis ... 442
State Hospital Commission, Gov. Cox of Ohio Has Appointed a ... 223
Vegetative Nervous System, The ... 449
Workman's Compensation Act ... 102
Workmen's Compensation Conference, Missouri ... 218

BOOK REVIEWS.—Notices, etc.

Battle of the Somme, The ... 238
Doctor In Court, The ... 358
Hospital for the Insane, Central Indiana ... 116
Infantile Paralysis, The Treatment of ... 115
Iodiomycosis, Systemic ... 237
Journey Around the World by an Oculist, A ... 237
Man, An Adaptive Mechanism ... 114
Mental Adjustments ... 237
National Service Hand-Book ... 358
Nervous Diseases, Diagnostic Symptoms in ... 237
Organ Inferiority and Its Physical Compensation, Study of the ... 117
Psychoanalytic Movement, History of the ... 116
Psychopathic Hospital, State ... 358
Theory of Sex, Three Contributions to the ... 115

CORRESPONDENCE.

Latah and the Like ... 112

The Alienist and Neurologist

VOLUME XXXIX JANUARY, 1918 NUMBER 1

THE PSYCHOLOGY OF MORPHINISM AND ALCOHOLISM.

By

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I HAVE been requested by the Editor of the *Alienist and Neurololgist* to contribute an article upon some of the more intricate matters connected with the pathology or etiology of nervous disease.

As my work is limited to the treatment of the drug and alcoholic neuroses, I suppose that he would naturally expect something along these lines from me.

The psychology of morphinism and also of alcoholism is best learned by direct observation of morphine and alcoholic addicts.

Unless one drops all preconceived and biased views of addiction in general one is apt to get a very distorted notion of the psychology of the morphine or alcoholic addictions.

The busy alienist has but little time to study these cases.

In this article I shall limit myself to a study of the more obvious mental and moral symptoms of these neuroses that have a practical bearing upon the management of these cases.

The keynote of the psychology of morphinism is self-depreciation.

For out of this mental state arises the secretiveness, prevarication, seclusion, and the morphine or opium cowardice.

The addict is secretive because he imagines that others have the same poor opinion of him that he has of himself. With the harsh laws that we now have against opium addiction there are prudential reasons for secretiveness. However, this mental state was every whit as pronounced before there were any laws against the use of opiates in existence.

To the normal person secretiveness may seem a trifling matter. To the addict it is an almost insurmountable barrier between him and complete recovery from his disease.

When he is counselled by a friend or his family physician to seek treatment for his affliction, he denies vehemently that he is an addict. And thus puts himself in a position where his friends are unable to assist him. The commercialists who are in this work understand enough of this feature of morphinism to exploit it. The quick cures that they advertise appeal very strongly to the addict, because he sees a chance to slip away on the sly and get back again before he has been missed. Again they are perfectly safe in promising a cure or money refunded, because they know that addict's secretiveness will prevent him from seeking justice in the courts. While the fakirs know this much about the psychology they do not know or do not care to know that secretiveness is one of the damages done by opium and therefore should be relieved.

Secretiveness, while not visible to the eye like the physical damages done to the tissues by other diseases, is every whit as deplorable. It is, as I have said, an obstacle to recovery. Further, the sly and shifty ways that arise from it are a great damage to the addict's social and business standing.

It must be removed or mitigated in order to get the addict to consent to taking time enough for his treatment and convalescence. *Time is needed to secure a cure of morphinism.* It matters not whether quick methods of removing the drug are used or not. In fact, where quick methods of removing the drug are used a longer time is needed for recovery.

It can be in a measure overcome by instructive suggestion. The first idea to be put in the addict's mind is that secretiveness is pathological. It is really an obsession and, of course, does not yield readily.

The convalescent addict who imagines that his addiction was unknown to everyone, leaves the door wide open to relapse. For this reason, I try to persuade all my patients to make a confident of their near friends. An obsession of any kind is very hard to overcome and this one is no exception. I frequently have to work with my patients day after day to get them to consent to this safeguard against relapse.

After the addict has made a full confession to his friends, he feels a great relief. And he has secured a moral support that will be a great help to him.

Prevarication is another of the damages that the addict has to endure. The damage is to the mental and moral attributes of the individual, but it is just as real as a broken arm. The *drug makes* the addict feel that he has not only a right to lie about his addiction but that it is his duty to do so.

The addict has a worse reputation in this regard than he should have. On matters in no way connected with his addiction, either directly or indirectly, he is as truthful as he ever was. It takes one who is familiar with the peculiar workings of the addict's mind to be able always to see the connection between some of their prevarications and their addiction.

There is a characteristic sameness about the opium lie that generally enables those of us who are in constant touch with these people to tell when they are lying and when they are telling the truth.

Seclusion is another of the ravages wrought by this disease. It arises directly from self-depreciation in the first instance. That is, this is the motive that prompts them to hide away.

But there is another element to it. Opium makes one fond of day dreaming. The addict becomes irritable if his thoughts are interrupted by the chattering of other people. The addict can sit alone in his room day after day without becoming lonesome. In fact, solitude is about his only comfort. As the years go by this solitude becomes nocturnal, *i. e.*, the addict sleeps days and is up about his room during the night. And in this way he gets neither sunlight or fresh air. And in due process of time he gets to look about as healthy as a potato that is grown in a dark cellar.

So when I say that seclusion is one of the ravages of morphinism, I speak as one having authority.

When one of these addicts who has carried seclusion to extreme comes under our care, it is necessary that we get him out into the air during the day.

The real motive for the continuance of the use of morphine is the terrible mental and physical suffering caused by its discontinuance.

Equally with secretiveness the opium cowardice is a great barrier to the addict's recovery. Self-confidence is the basis of all courage.

The suffering caused by the discontinuance of morphine is very real and one that the normal person would shrink from. And when we take into account that morphine undermines the courage, we can readily see how important this feature of the psychology is. But it is important in many other ways, as I shall presently show.

The reader knows that pain and an exalted nervous state like hysteria will neutralize large doses of morphine. However, I doubt if the reader is aware that the opium fear, once it becomes thoroughly aroused, will neutralize much greater doses. To quiet a house full of patients who are frightened, with morphine, is like pouring water through a sieve.

Now it is my opinion that it is good therapeutics to correct the damages done by any disease.

Therefore, to build up the addict's courage, self-respect and self-confidence, I use no restraints.

Of course, in order to do this you must first keep him comfortable. One who is master of the technic of reduction can do this. This is no theory, for I have been doing it for several years.

I cannot conceive of anyone doing this who is ignorant of the peculiarities of the opium cowardice. A very little morphine will keep a patient comfortable if you can keep his fears allayed. On the other hand, when he is frightened great quantities of the drug will fail. The suffering that the addict undergoes under these circumstances is not imaginary. It is very real. So the reader can understand how important this feature of the psychology is. We all know that an unwholesome state of mind will aggravate any suffering. This is true to a much greater extent among morphine addicts. When one understands this cowardice, it is not difficult to keep it under control.

I conceive that it is just as necessary to build up the addict's courage and self-respect as it is to reduce a fracture.

In many cases the addict seems to revert to the child type of mind. In their jealousy of one another they go farther than the child type of mind and remind one more of the dog.

For this reason I try to devote an equal amount of attention to each patient. If one fails to take this mental attitude into account a great deal of unnecessary disturbance will arise in the house.

The addict's memory for things that occurred before his addiction seems to be clear cut and distinct.

In this respect they remember the aged, especially as their memory for recent events is very poor.

This may be in part due to the direct effect of the drug upon the brain. I think, however, it is chiefly due to the fact that the addict's attention is not sharply drawn to the things that are being said and happening about him. For I notice that when the addict's attention is sharply drawn to any particular thing that he seems to be able to remember it as well as anyone would. The thing that is hardest of all for him to remember is what he said yesterday. I take advantage of this to get the patient's history. A patient will tell me that he has used the drug five years. He forgets this and in a day or two admits that he has used the drug seven years; after a time, it will be twenty years.

This is important, for the length of the addiction has more to do with determining the rate of the reduction than the daily amount used.

I notice that those physicians who became addicts late in their professional life seem to retain their medical knowledge better than those who become addicts early in their professional career. This is, of course, true of any calling.

The writings of many whom I would consider incompetent observers would lead us to suppose that the opium addict was a hopeless moral degenerate.

I have not found this to be the case. Let us take two addicts, one who was noted for his vicious activities before he became an addict and the other one who was noted for his religious and moral activities. We will find that the one takes less and less interest in his vices and that the other takes less and less interest in his virtues. And that as time goes on they gradually reach a common mental attitude or at least very nearly so. That is, they reach the ordinary mental attitude of the morphine addict.

I had a patient once who was very nearly a gentleman under 40 or 60 grains per day, who was a vile scamp off the drug.

The addict's indifference and carelessness gives him an appearance of moral degeneracy that is not real. If he was ever honest, he will be found to be honest still. If he was dishonest before becoming an addict, he will still be dishonest. Although the honesty of the one and the dishonesty of the other is not so active. My observation of those who reach complete convalescence is that they return to their pre-addiction moral and social status. In one case where the addiction began at the age of twelve the patient was a moral imbecile.

I fancy that this would be the usual result in cases where the addiction begins so early in life. In such cases it would naturally interfere with mental and moral growth.

I have now to speak of a feature of morphinism that has been distorted by many writers.

A few female addicts who were once moral and cultured do become prostitutes. Morphine makes most individuals asexual. So sexual appetite cannot be the cause. The cause in most instances is to get morphine. To my mind the real moral responsibility in this case rests with the ignorance and indifference of the profession to the whole subject of morphinism.

The addict should be provided with one of two things, either morphine enough to keep him comfortable or skillful treatment. When we take into account the terrible suffering caused by the withdrawal of the drug and further the cowardice that develops sooner or later, is it a matter for surprise that when a woman who has been turned adrift by her husband and friends should resort to any means at all to procure the drug?

The public should be so well informed by the medical profession that no woman should have any need to be exposed to such degradation as I have just mentioned. *The morphine addict is sick* and is as much entitled to humane and skillful care and protection as any other invalid.

Let me repeat that self-depreciation is the keynote of morphine psychology. No morphine addict can be said to be cured who has been merely put beyond the physical craving for the drug.

He must, also, by suggestion and instruction, be restored to the normal habits of thought.

"As a man thinketh in his heart, so is he." The removal of the drug of itself causes a great mental improvement.

However, the mind does not become at once normal as soon as the last dose is removed.

Hence the need of careful suggestion in order that this may be brought about at as early a date as possible. For as long as the convalescent retains the morphine brain there is danger of relapse.

Before taking up the study of the psychology of alcoholism, I think that it is best for me to define the scope of my work. Where there are gross lesions of the nervous system induced by alcohol, it is the province of the general neurologist to look after them. Gross lesions of the stomach, liver, kidneys, etc., belong to the internist, and serious derangement of the mental processes belong to the alienist.

My principle aim so far as alcoholism is concerned is to assist the alcoholic to rid himself of the further abuse of this toxic agent altogether. And it is my purpose in this article to pay especial attention to the mental and moral symptoms of this disease that have a particular bearing upon the success or failure of my efforts in this direction. Incidentally it often becomes our duty to direct our efforts to saving the life of the victim, if possible. For these cases are sometimes brought to us in such a desperate condition, that the present becomes of more importance than the future prospects of the patient.

Let us first consider the motive or motives that the alcoholic has for the continuance of his addiction. For our present purpose we will divide them into two great classes. There are many to whom profound inebriety is decidedly displeasing, but to whom a mild stimulation is pleasing. If these people continue the use of alcohol it is by no means uncommon that a little larger amount is gradually needed to produce this stimulation. This amount may become so great that the addict gets into a state of almost constant malaise. And yet when the stimulant is left off altogether he becomes positively ill. His nerves become so unsteady that work is out of the question. In these cases physical suffering becomes the principle reason for the continuation of the addiction.

Out of every thousand people there is a small percentage among both males and females, to whom the sensations of inebriety are decidedly pleasing.

These people should never use alcohol at all. It is this class that furnishes the greatest number of inebriates.

It is not for me to say whether moderate drinking is advisable or not. I do not come in contact with the moderate drinker. It is always the immoderate drinker that comes to me for assistance.

Alcoholism has been more or less understood for at least 4,000 years and perhaps twice that long.

And yet, who can explain why a certain small percentage out of every thousand persons who use alcohol become inebriates and the larger percentage do not?

Some say that it is because the inebriate has less will power. This explains nothing. It has been my observation that the inebriate shows no weakness of volition except in the one matter of alcoholic indulgence. If the will is weak, it should be easy to demonstrate the fact by other actions of the inebriate.

Others very complacently say that it is because the inebriate has less sense than other people. Unfortunately for this explanation, it is well known that many of our most brilliant people are numbered among the inebriates, both today and during the past history of our country.

Then again we are told that the moderate drinker and the total abstainer have a higher moral status.

This statement is not true, for it is well known that many inebriates have greater respect for women, a keener regard for honor, than the average abstainer. On the other hand there are many gamblers, thieves, safe-blowers, and other gentry of a like caiber, who never permit alcohol to interfere with their nefarious practices.

Among medical men there are many who think that there is always a lowered nervous tone among these cases. This may be so in some cases, but those who have come under my observation have been remarkably good specimens of physical manhood outside of the ravages produced by the addiction itself. It is my opinion, and the reader can take it for what it is worth, for it is only an opinion, that among those who are likely to become inebriates, this stimulant makes a more profound or pleasing impression upon the senses. I also think that these impressions become fixed in the subconscious mind of the individual and constitute the cause of the continuance of the addiction in the second great class of inebriates now under consideration. The first class who get in a bad way through the increase of the daily amount consumed are much more easily cured.

The reader will remember that I said earlier in this article that the keynote of the psychology of morphinism was self-depreciation.

In alcoholism it is almost the opposite state of mind that prevails.

For the alcoholic is obsessed by a pathological optimism. This state of mind is one of the great obstacles to be overcome in curing these people. This optimism shows itself in many different ways.

The inebriate who comes home after a spree with a black eye and other evidences of manhandling came to grief because of an optimistic idea of his physical prowess.

The man who starts for the bank with a large sum of money in his possession, with the idea of making a deposit returns home without a cent and without having ever reached the bank, through an overestimate of his ability to care for money.

Some readers might at once jump to the conclusion that because this same thing had happened to this man before on numerous occasions that he must be a fool. I wish to say that many a lawyer who was able to outwit skillful opponent in the courtroom has done this very thing not only once but several times. No, this action is not due to foolishness, but to *alcoholic*, and therefore *pathological*, optimism. The reader will take note that the action was not due to acute inebriety, for the man starts for the bank while he is perfectly sober and well aware that he has lost money in this same way before. And he ought to realize that it is not safe for him to attempt to pass a saloon with a large sum of money in his possession.

One feature of this alcoholic optimism that makes it a barrier to be overcome in the treatment of these cases, is the idea that they are always mentally and physically fit.

I have cared for cases who have been very near death's door and when they came to themselves, have told them, as I would any other patient, of their condition and had them laugh in my face.

I have informed others that they had sclerosis of the brain, liver and kidneys and that unless they succeeded in the discontinuance of the alcohol, they would not live long. They would pooh pooh at me and say, "do not worry, doctor, I will outlive you." It is a great thing for the inebriate to rid himself of alcoholism. It goes without saying that a strong desire is a great help in the accomplishment of any great undertaking. This pathological optimism needs to be broken up, for it stands in the way of a desire to get well. Sometimes accidental circumstances accomplish this. My method is to keep those disadvantageous and disagreeable features of alcoholism constantly before the addict's mind.

I hold no prolonged talks. I refer to some incontrovertible, disagreeable feature of alcoholism in the fewest possible words. Later, I refer to some other disadvantageous feature. If one doubts the value of repeated suggestion, let him call to mind the fact that he cannot forget the benign features of Lydia Pinkham if he would. I am hampered by the fact that the infamous Dr. Keely, many years ago, fixed four weeks as the proper time for the treatment of the alcohol habit. This idea seems to still prevail. How ridiculously short this is to produce lasting impressions, we can judge by calling to mind that during the first part of this period the patient is too much intoxicated to be susceptible to suggestion. The other great obstacle to success is the obsession that without his cups life would be a dreary waste and not worth the living.

No matter how long the period of abstinence may be, as long as the convalescent alcoholic is obsessed by this idea, he is in constant danger of relapse.

And, of course, this obsession interferes very much with the addict's acquiring a wholesome desire to get well.

I think that in general terms we are justified in looking on the alcoholic's mental attitude as the chief factor in the continuance of the addiction and also as the principle obstacle to be overcome in securing a cure.

Some say that if an alcohlic does not want to get well it is impossible to cure him. That is not true. Many a man who was violently opposed to life insurance has been persuaded to take out papers by a skillful agent.

Many men draw large salaries because they are able to persuade others to do the very things that they do not want to do.

A man who makes a pretense of being a specialist in this field of medical endeavor, should never throw up his hands in despair because his patient does not manifest any very lively desire to get well.

To further impress upon the reader's mind the importance of the abnormal and vicious circles of thought produced upon the alcoholic's mind by repeated inebrieties, let us study for a moment the periodical drinker. These parties often stay sober for a year or more at a time.

Many are uncharitable enough to say that any man who can stay sober a year can stay sober always.

I have my doubts about this. In a great many instances those associated with the periodical drinker can foretell these sprees a week or more in advance of their occurrence by the increasing irritability of the addict.

This would seem to prove that there must, on such occasions, be a profound conflict going on between the rational and abnormal elements of the addict's mental makeup.

My preceptor in this line of work had kept a man of this type sober for five years, when I last knew of the case, by persuading the party to come to him when he felt one of these spells coming on, instead of going to the saloon. It is absurd to suppose that one can have a physical need of alcohol five years after the last drink.

It is not absurd to suppose that the abnormal circles of thought that have been induced by repeated inebriety may not persist for many years after the last drink.

I do not wish the reader to suppose that I am a crank on the importance of psychotherapy in the treatment of drug and alcoholic addictions.

The need of putting these patients in good physical condition by ordinary physical means is *imperative*.

However, if we wish the physical improvement to be lasting, there is need of supplimenting these by the use of psychotherapy.

Many say we can cure the addict but we cannot give him brains to keep him from a relapse.

No, but we can train the addict's brain into normal channels of thought in a gratifying percentage of cases.

By so doing we raise the percentage of permanent cures about twice as high as would otherwise be the case.

Let me repeat: Opiumism, secretiveness and pathological cowardice, are the chief psychological features that need combating.

In alcoholism, it is pathological optimism and the obsession that life would be miserable without alcoholic indulgence that are the great obstacles to be overcome.

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THE PATHOLOGICAL FINDINGS IN THREE CASES OF JUVENILE GENERAL PARALYSIS.

By

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GENERAL paralysis occurring in children and young people has only been well recognized since 1877 when Clouston first clearly described this condition. Several French writers had previously pointed out the fact that the syndrome similar to that of general paralysis had been found in young people, but had not definitely revealed the identity of the two conditions. Clouston's findings were not received by many men and for several years some authorities refused to admit that paresis could occur in children. Regis in 1883 really demonstrated the identity of juvenile and adult paresis, and Toulouse in 1893 reviewed 14 cases from the literature. Even at this time many men refused to admit that paresis could occur in young individuals. Alzheimer in 1896 collected all the cases which had been reported up to that time, 34 in number, and summarized the clinical and anatomical findings. Mott, in about 1900, in Volume I of the *Archives of Neurology*, reported 22 cases, and stated that his cases brought the total number that had been reported with autopsy up to 89. In 1910 the cases reported had reached a total of about 250.

In talking of juvenile general paralysis one should define the term. Mott, in his work, spoke of cases occurring in young people even up to the age of 23 years. The other authors, however, have arbitrarily agreed that only cases of general paralysis beginning at or under 20 years of age should be classed as cases of juvenile general paralysis.

It is somewhat difficult to establish the real frequency of general paralysis among children, as many of them do not show mental symptoms sufficiently pronounced to cause them to be incarcerated in an asylum and a considerable number are sent to feeble-minded institutions where their psychosis is not recognized. Many are also kept at home because in some instances the process is a simple deteriorating one and they can very easily be kept at home. The duration among many of the children is quite short, and this also accounts for many not being sent to hospitals for the insane.

We have been very fortunate in the last two years in obtaining the brains from three cases of juvenile general paralysis for study, and the following are abstracts of the histories and the pathological findings:

A. U.—Admitted to the Chicago State Hospital, age 21. Family history: One brother is said to have had right-side paralysis and to have had many spasms when a baby. At the present time he is sick with some nervous trouble. Both mother and father had syphilis. Mother has had many miscarriages.

The patient is said not to have been very bright when younger; always had a large head. He went to school for five years, from 8 to 13 years of age, and reached the fifth grade. Afterwards he worked in a department store for about three years, and then worked in a millinery store. The present illness began about two years before admission, when the patient was 19 years of age. His speech became affected and when he would attempt to talk he would be unable to say the words he wished. He would shake all over, became very unsteady on his feet, and his memory was very poor. He was taken to the County Hospital and while there had several convulsive seizures and became untidy in habits.

On examination at the State Hospital he presented a typical paretic speech defect and all the physical signs of paresis. The Wassermann reports on the blood and spinal fluid were positive. There were positive cell counts and positive globulin tests.

The examination of the brain revealed a marked thickening of the pia and a remarkable increase in the blood vessels of the pia. The larger vessels showed a great proliferation of the endothelial cells, these cells being increased in size and projecting into the lumina of the vessels. Large numbers of lymphocytes and plasma cells were seen infiltrating the layers of the pia. This infiltration was most marked about the vessels and especially in the adventitial lymph spaces. The blood vessels in the cortex were much increased in number and the endothelial cells also showed signs of proliferative changes. Many of the vessels showed very marked fatty deposits in the walls. Plasma cells, lymphocytes and a few mast cells were found in the perivascular lymph spaces.

The ganglion cells were reduced in number, especially in the superficial layers of the frontal and precentral cortex. The nuclei of many of the cells were not clear and the chromatin elements in many cells stained diffusely dark and could not be well distinguished.

The neurofibrils stained poorly in all the sections and there was some clumping of the febrils in the processes with considerable fragmentation and net-like formation in the cell body. There were a few very small clumps of pigment in the cells, but they were only rarely found. Fatty changes were seen in many cells, but the lipoid deposits were nowhere excessive.

In the cerebellum were found a fairly large number of double nucleated Purkinje cells. These cells were practically the same size as the normal cell, but presented two nuclei usually lying side by side. Occasionally these cells seemed to have somewhat of a spindle shape, but for the most part they preserved the shape of the ordinary Purkinje cell.

The neuroglia cells were increased in number throughout the cortex and hypertrophied astrocytes were very numerous, especially in the superficial layers of the cortex. The neuroglia fibres were enormously increased in number and along the marginal zone there was a very thick layer of neuroglia fibres among which were found several neuroglia cells. Many of the neuroglia cells showed fatty changes and vacuolization. *Stäbchenzellen* were found in practically all the sections and were quite numerous in the frontal region of the cortex. Satellite cells were also frequently found.

In this case we have the findings both physically and pathologically of general paralysis. The distinctive feature possibly is the large increase in the endothelial cells in the blood vessels, which in some cases almost resemble those found in syphilitic endarteritis, but in the perivascular lymph spaces were found many plasma cells and lymphocytes which are not characteristic of the latter condition. In the cerebellum also were found many double nucleated Purkinje cells which are only infrequently found in cerebral syphilis.

J. D.—Aged 17. Admitted to the Lincoln State School and Colony on May 17, 1915. There was very little information obtained regarding this patient. He was at the Cook County Infirmary, where he had been sent from the County Hospital for treatment for his eyes. At the Cook County Hospital it was said that he had a form of syphilis of the central nervous system which was congenital. He was sent to the State School for the Blind and later to Lincoln State School and Colony.

Physical examination showed pupils which did not react to light or accommodation. Vision was impaired. There was a slight internal convergent strabismus of the right eye. The patellar reflexes were absent. There was a notching of the lower and upper incisors, suggestive of Hutchinson's teeth.

The psychological examination is reported as follows:

The patient has a chronological age of 17 with a mental age of about 8 years. "He was observed today at the North Hospital. He was somewhat talkative, saying frequently, 'Will the doctor be so kind as to give me some money?' or special favors, for which he would thank one profusely. He had no delusions or hallucinations. He indulged in considerable drollery and buffoonery and made examination difficult. He passed sufficient tests, however, to be graded with about 8 years' mentality. His vision is so limited that he can only distinguish black and white, shadows, large areas of colors as a flower bed, etc."

He was observed again on October 2d. He was less active mentally, speaking only when spoken to and lacking interest in the German language in which previously he had been interested in speaking. He showed an inclination to sleep and on one occasion stretched himself on the floor. The attendant reported that he had become untidy and lost interest in himself and his surroundings considerably. The memory seemed to be failing somewhat. There was a progressive mental deterioration which was quite rapid and continued until he died on December 24, 1915.

Examination of the brain revealed an atrophy of the convolutions in the frontal and parietal regions and considerable subpial exudate in the sulci. The pia was thickened along the longitudinal fissure and along the central fissure it was greyish and thickened. The pia at the base was thin and the vessels showed no marked thickening.

Microscopical examination revealed thickening of the pia over the entire cortex, most marked in the frontal, precentral and postcentral regions, and in sections from the occipital lobe over the visual cortex there was considerable infiltration of the pia, with lymphocytes but little increase in the fibrous tissue layer. In the vessels of the pia were large numbers of lymphocytes and a few plasma cells.

The number of new blood vessels in the cortex was much increased and there were many new-formed vessels found in all the regions. In the hippocampal region the new vessel formation was most marked, and in one area a large collection of them were seen massed together in a fashion somewhat resembling a haemangioma.

The endothelial cells are quite large and budding cells were not infrequently found. A considerable number of endothelial cells showed lipoid deposits in the cell bodies. There was some slight tendency to splitting of the elastic fibre layer in some of the larger vessels, but this was not especially marked. In the adventitial lymph spaces were found large numbers of lymphoid and plasma cells which varied considerably in different vessels. Plasma cells were present in large numbers and about the smaller vessels they predominate. Few mast cells were seen about any of the vessels.

There was a marked reduction in the number of nerve cells in all parts of the cortex and the cells seemed somewhat narrowed and shrunken. The nuclei presented various degenerative changes and the chromatin masses were, as a rule, broken up considerably and in only a few of the large pyramidal cells, Betz cells and Purkinje cells were normal chromatin masses found. In the cerebellum a number of the Purkinje cells were found to have two nuclei, usually placed side by side. Each of the nuclei had a nucleolus and the two nuclei were quite separate and distinct from each other in every way.

The neurofibrils were very much disorganized in some of the cells and were seen in the form of small granules. In a few cells, however, the neurofibrils seemed unchanged. Many of the ganglion cells showed large vacuoles and in the Scharlach specimens lipoid deposits of comparatively large size were found in a number of the cells. Pigment masses of small size were found in a few cells.

The neuroglia cells and fibres were much increased in number throughout the cortex and the size of the fibres and cells were much increased. Neuroglia cells containing vacuoles, granular and lipoid deposits were quite frequently found. The marginal zone showed a very marked increase in the number and size of the neuroglia fibres.

In the section of the cord stained with Weigert's fibre stain a distinct thinning of the posterior column tract, involving especially Burdach's column was found in the cervical cord. Helweg's spino-olivary tract also showed some thinning, but Goll's column was affected very little, if at all.

In this case we have the changes usually found in general paralysis quite pronounced and there is a fairly distinct history of congenital lues. The exact nature of the eye trouble was not determined.

D. H.—Admitted to the Lincoln State School and Colony on September 16, 1914, aged 16 years.

There is said to be nothing of importance in the family history except that the father was a hard drinker.

The patient was born in 1898 and was stated to be normal until about 1909; at the age of 11, when he began to retrograde, showed loss of memory and concentration and became dull and stupid.

On examination at Lincoln there were found unequal pupils, the right being larger than the left, and both reacting very slowly to light. The movements of the facial muscles on the left side were a little more prompt than on the right. Movements of the upper and lower extremities were stronger on the left than on the right. The gait was markedly spastic. The knee-jerks were very active, the right somewhat more active than the left. Biceps and triceps reflexes were exaggerated, more so on the right side. Babinski sign positive on both sides.

During the mental examination it was noticed that he was slow to respond to questions, his speech and general actions being retarded. He was careless of his personal appearance, paid very little attention to his surroundings and when he was questioned appeared to have a distant look on his face. He had a tendency to repeat things three or four times.

As this patient did not impress one in the same manner as the usual case of feeble-mindedness, he was examined further on several occasions. No information pointing to the presence of hallucinations or delusions could be obtained. He was fairly well oriented, but his memory, especially for remote events, was poor.

He was examined by the psychologist, who reported that he was a high-grade imbecile with a mental age of about 6 1/5 years. He also remarked: "Unsteady gait—trembling hands prevent drawing well. Responses somewhat more ready than a typical feeble-minded child of this age." Early in November, 1914, it was noticed that he was not so bright mentally as on admission and that his reactions were rather peculiar. No special attention was paid to this, but about the middle of November it was reported that he had several epileptiform convulsions, became very excited, talked incoherently to himself and mentioned the names of various members of his family. The mental condition was such that he could not give any coherent explanation of things. He laid in bed, tore up the sheets and his nightgowns, and talked incoherently.

In the middle of November it was noted that he had undergone rapid deterioration mentally. He stated that he had heard his mother talking to him the previous night, and he appeared less interested in his surroundings than previously. His responses were much slower and he answered questions in a more incoherent manner. There appeared to be more impairment of memory. His physical condition continued to show a marked reduction. He lost gradually in weight and strength and became more unsteady on his feet. At times his habits were untidy. He paid little attention to his personal appearance.

In January, 1915, he is noted as having undergone a moderately rapid mental deterioration and a progressive paralysis of the extremities. In February, 1915, he was mentally very disturbed and quite emotional. On November 28, 1915, he is noted as being a typical case of juvenile paresis. The blood serum and spinal fluid both showed a strongly positive Wassermann reaction. Gait was more ataxic and he showed considerable depression. He died on January 12, 1916.

At the autopsy the bones of the skull were markedly thickened. The dura mater was closely adherent to the skull. There was an increase in the fluid and considerable atrophy of the convolutions of the brain. After hardening in formol for some time the brain weighed 755 grms. Both ventricles were somewhat dilated, the left being somewhat more so than the right. An atrophic area involving the third right frontal convolution was found covered by a layer of thickened pia under which lay considerable amount of fluid. A smaller area of atrophy involved the posterior part of the left angular gyrus. The tip of the left temporal lobe and the first left temporal convolution also showed considerable atrophy. The pia over the frontal, parietal and temporal regions was much thickened. The large vessels at the base of the brain showed no thickening of the walls.

Microscopically the pia mater over the sections from all parts of the brain was found to be thickened. There was an increase in the thickness of the outer fibrous layer and beneath this in the areolar tissue surrounding the blood vessels was found a marked infiltration with lymph and plasma cells. The number of blood vessels throughout the cortex was very much increased and many new-formed vessels were found. Budding or process cells were found in a few blood vessels, but no mitotic figures were found in any of the endothelial cells.

There was some splitting of the elastic fibre layer, especially in the medium-sized vessels. Plasma cells, lymphocytes and a few mast cells were found in large numbers in the perivascular lymph spaces, the plasma cells predominating. In some of the lymph spaces were found masses of granular, yellowish material with indefinite form and which did not stain with the aniline dyes. In the Scharlach specimens a few small deposits of lipoid material were found in the adventitial and endothelial cells.

The number of nerve cells was markedly diminished in all the areas of the cortex and many of the cells were broken up. The nuclei in many cells were intact, but in none of them were the chromatin particles normal. In the pons many of the ganglion cells contained rather large masses of yellowish pigment. Lipoid material was found in a number of cells in all parts of the cortex.

The neurofibrils were also somewhat degenerated, the fibrils usually being in the form of fine granules. In the cerebellum a considerable number of double nucleated Purkinje cells were found.

The neuroglia cells were very much increased in number and size throughout the cortex and the processes were longer and more numerous than usual. Satellite cells were quite numerous and *Stäbchenzellen* were found in all areas and were especially numerous in the region of the blood vessels. Degenerative changes such as granular and fatty deposits were found in a number of the neuroglia cells. The marginal zone was made up of a very thick layer of closely interwoven neuroglia fibres.

In this case also we have a typical history of a fairly rapidly advancing, deteriorating psychosis in a boy of 16, and the pathological findings are quite characteristic of general paralysis.

The ratio of frequency of occurrence of this disorder between girls and boys varies with different authors, but all agree that it is a little more frequent among the boys than with the girls. Ranke found the ratio to be one girl to one and one-tenth boy. Frőlich found the ratio to be one girl to one and one-third boy. Arsimolles and Halberstadt, in 205 cases, found 118 boys and 87 girls. The age of onset varies considerably, but the onset in the majority of the cases begins between the ages of 14 and 19 years inclusive. The figures of Arsimolles and Halberstedt—171 cases—are as follows:

4 years	1
5 years	1
6 years	1
7 years	4
8 years	3
9 years	8
10 years	11
11 years	14
12 years	15
13 years	9
14 years	18
15 years	18
16 years	16
17 years	17
18 years	15
19 years	12
20 years	8

These figures seem to agree in the main with those which have been published by other authors.

Even before it was definitely determined that syphilis was the underlying factor in the development of general paralysis, it was quite definitely settled that hereditary syphilis was a very great factor in the production of juvenile general paralysis. Alzheimer, in 41 cases reported in the literature, found hereditary lues as follows: 26 showed positive syphilis in the antecedents, 11 unknown, and 4 were said to have had no syphilis in the parents. Arsimolles and Halberstadt, in 160 cases, found certain syphilis in the parents of 105 cases, probable in 25, possible in 20, and 10 of the cases showed acquired syphilis. In a considerable number of the cases general paralysis was found in the parents, and in Arsimolles' and Halberstadt's cases, general paralysis was found in the parents of 20 out of 171 children who had juvenile general paralysis. Homen, in 1891, found 4 brothers and sisters suffering from this disorder aged respectively 10, 12, 18 and 20 years. Hoch has reported two sisters who developed juvenile general paralysis, one at the age of 10 and the other at the age of 11 years.

The physical and mental development of children who later show signs of juvenile general paralysis is said by Alzheimer, based on a study of his cases, to be that of normal children. Toulouse and Marchand found many of these children to be very much retarded mentally and some were even idiots long before the development of the psychosis. In early cases—cases beginning before puberty—sexual development is retarded or abolished and many of the female patients never menstruate.

The mode of onset in these cases varies, depending partly on the age and probably considerably on the makeup of the individual. Most frequently there is a simple intellectual decline. The changes noticed are slowly advancing. There is more or less physical weakness, difficulty in comprehension of simple things, more or less apathy and memory defects which may be quite marked very early. There is some irritability and a tendency to excessive anger. Depression and anxious states are found in some of these patients, although not in a very great percentage. More rarely maniacal excitement occurs and several cases showing well-marked fugues have been reported. Convulsive attacks have marked the onset in a number of the cases or the physical symptoms, such as weakness of the legs with difficulty in walking or awkwardness in the movements of the hands and arms, may be more marked than the mental. The general tendency is downward to a simple dementia without marked delusions, hallucinations, excitement or depression. Exceptionally one meets cases in which delusions are marked and these show a most diverse content. Some patients show a simple satisfaction and euphoria, while others may develop true ideas of grandeur, but these are usually puerile in character and have been characterized by one writer as "little grandiose ideas." More rarely ideas of persecution, of jealousy, hypochondriacal ideas and even attempts at suicide occur. On the sensory side one may have illusions which may be quite marked even up to very definite hallucinations, either of hearing or sight or of both combined. These hallucinations, however, are not marked and do not occupy a prominent place in the picture except in a very few cases.

On the somatic side, the symptoms are usually more accentuated in the children than they are in the adults. The period of onset is very frequently characterized by predominant physical symptoms, and certain signs which occur late in the adult are found very early among the children. Convulsive attacks are very frequent and vary from light congestive attacks, followed by headache and no loss of consciousness, to epileptiform attacks with loss of consciousness and paretic troubles which recede very slowly. In these cases the pareses may be often localized and may take the form of hemiplegia or monoplegia. Rarely the epileptiform convulsions are Jacksonian in character. Contractures often occur and may reach the same grade as in adults. Spastic conditions with a Babinski sign are quite often found. The tendon reflexes are often exaggerated, but may be diminished or absent. Frőlich, in 50 cases, found the tendon reflexes exaggerated in 37, diminished in 3 and absent in 10. Choreiform movements of the hands and body are very frequent. Incoordination of the hands and feet, difficulty in walking and awkwardness in making movements of the hands are quite frequently found. True apraxia has been reported by some observers. Aphasia is rare, although transitory aphasic attacks have been reported. Difficulty in speech occurs later in the course of the disorder and is less characteristic than usually found in the adult. The pupillary disturbances are the same as in the adult, although Trőmmer says that the light reflex is absent more constantly in cases of juvenile general paralysis than it is with the adult. Nystagmus, strabismus and amaurosis, due to optic atrophy, may occur. There is an arrest of physical development which occurs especially in the cases beginning about puberty, and in some instances this has been very marked.

The course of the disorder is downward, but the duration is possibly a little longer than with the adults. Mott has stated that in cases beginning in young individuals the duration is much longer than in those in whom the onset occurs about the age of 20. In this latter case, the disorder may be fulminating in type and may last only a few months, while earlier cases frequently live much longer. Hirschl, in 20 cases found an average duration of the disorder to be three and three-fourths years. Other observers, among them Babonneix, found the average duration to be between three and five years. Some observers have reported cases in which the duration of the disorder was long, even up to nine years. Remissions are exceptional and when they occur are always rather short.

In general the pathological changes are quite similar to those occurring in cases of adult general paralysis. The skull cap is often thickened and exostoses are frequently found on the calvarium. Hemorrhagic pachymeningitis is quite common and leptomeningitis often of a very marked grade has been reported by some observers. Some cases have been noted where the leptomeninges were 3 or 4 m. m. in thickness. There is usually an excess of fluid in the subdural space and sometimes a true hydrocephalus occurs. Atrophy of the convolutions with widening of the sulci is found as in the adult cases, and this atrophy is especially noted in the frontal region, although it may also be seen in the parietal area. Softening of the temporal lobe was noted by Alzheimer in one of his cases. The brain stem also showed some atrophy and Alzheimer has laid considerable stress on this shrinkage of the medulla and pons.

The number of cells in the cortex is usually diminished. Usually this reduction in the number of cells decreases as one passes inward to the depth of the cortex, but in one case of Alzheimer the opposite is true, the deeper layers suffering very much and the two superficial layers being almost entirely intact. The ganglion cells show fatty changes and various alterations of the chromatin particles and nuclei. Pigment is not seen in the younger cases, this being almost entirely a change due to age. Heterotrophic cells are not infrequently seen in the cortex and occasionally large pyramidal cells with two or more nuclei are found. There is often a complete absence of the tangential fibres and sometimes the radial fibres are also destroyed. Mingazzini has insisted that in the adult one never finds such a marked atrophy of the radial fibres as occurs in the cases of juvenile general paralysis, and he thinks that it is partly due to the long duration of the trouble and also due to the fact that the tangential fibres were not entirely developed at the time when the trouble began in the child. Plasma cells are found about the blood vessels in about the same proportion as in adults. In one case Trapet found a very abundant supply of lymphocytes, especially in the meninges, and this he thought pointed to the fact that the disorder was especially a meningo-encephalitis. The blood vessels are much increased in number and new-formed blood vessels with thin walls are found throughout the entire cortex. In the thalamus, softening, atrophy, rudimentary development and congestion have been reported, and, while these conditions are not characteristic of the juvenile form, they may explain some of the early symptoms.

Lesions in the cerebellum are quite marked and are similar to those found in the cerebrum. The embryonic form of cells are especially numerous in the cerebellum and polynuclear Purkinje cells are found in the greater number of cases. It has been definitely determined that the nerve cells are not formed after birth, and that the polynuclear cells, such as are found in juvenile paresis and some cases of idiocy and cretinism, cannot be due to a cause acting after birth, but must be due to some developmental fault. It has been suggested that this developmental defect was caused by hereditary syphilis, but Ranke has combated this idea, because in five cases of hereditary lues he has found these cells in only one case. The polynuclear Purkinje cells are about the same size as the normal cell and the nuclei are usually both quite well-formed and appear normal. The chromatin particles in these cells are also normal. Trapet has pointed out several varieties of the cells, some with the two nuclei side by side in an apparently normal cell, others with two cells joined by a narrow bridge of material, while other cells occupy more or less odd positions, some being placed deep in the molecular zone, while others may be found in the tissues just under the pia.

In summarizing, we may say that juvenile general paralysis is a form of general paralysis occurring in individuals under 20 years of age and almost always is due to hereditary syphilis. The disorder occurs slightly more often in boys than in girls. Hereditary lues is extremely frequent in these cases, and a considerable number of the children have parents who have suffered from general paralysis. The physical and mental development of the children who later show signs of juvenile general paralysis varies, some being considerably retarded, while others are probably normal.

The age of onset varies considerably from 4 years of age to 20, but the greater number of cases begin between the ages of 12 and 19 years inclusive. The condition is a chronic progressive one, leading to a rather rapid physical decay. Definite hallucinations, delusions, excitement or depression are not especially frequent. The somatic symptoms are quite similar to those found in cases of adult paresis, but are usually more accentuated in cases occurring in early life. The course of the disorder is longer when the onset occurs in young individuals than in those occurring at about the age of 18 or 20 years.

The pathological changes may be summarized as follows: Thickening of the pia, often rather extreme, with infiltration with lymphoid and plasma cells. In some cases the lymphoid cells are extremely numerous. The cortex shows various atropic areas and there is usually considerable atrophy of the convolutions with widening of the sulci and a compensatory subpial oedema.

The cerebro-spinal fluid is usually increased in amount and the ventricles may be somewhat dilated even up to a real hydrocephalus. The nerve cells are diminished in number, especially from the outer layers inward, although the opposite has been recorded. The nerve fibres in the cortex, especially the tangential fibres, are destroyed, and the radial fibres suffer more or less in the various cases. The neuroglia cells are very much increased in number and in size. The neuroglia fibres form a thick network under the pia and are more or less pronounced throughout the cortex. The blood vessels show a marked increase in number and large numbers of new-formed blood vessels are found and many of the endothelial cells show various proliferative changes, such as budding processes, and in some instances, mitotic figures. About the blood vessels there is a layer of lymphoid and plasma cells as in adult paresis. The plasma cells, however, usually predominate. Mast cells are not especially numerous. Developmental defects, such as embryonic type of cells in the cortex and especially in the cerebellum, are usually found. In the basal ganglia there may be atrophy, suggesting developmental defects, or areas of softening, and the medulla frequently shows changes in form due to atrophy or developmental faults.

DIAGNOSIS OF FEEBLE-MINDED INDIVIDUALS.

By

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BECAUSE of the fact that feeble-mindedness is a mental condition and not a mental disease, to pronounce an individual feeble-minded is an exceedingly serious thing: in the first place, to the individual; in the second place, to the public; and in the third place, to succeeding generations. Mental disease or insanity may be, and many times is, susceptible of remedial measures; it may be, and often is, cured; but feeble-mindedness never has been, and never will be, cured. It is to be regretted that the condition known as feeble-mindedness does not have the legal standing, that for a great many years has been accorded to the condition known as insanity or mental disease. Insanity has a very well defined legal status, and this condition can usually be proved to exist in the individual suffering from it before any well organized court of legal jurisdiction; this is only partially true of feeble-mindedness.

For many years it has been difficult, or nearly impossible, to establish satisfactory proof of mental deficiency in the morons or higher grades of mental defectives before a judge whose tendency toward the criminal is one of leniency or "give him another chance," or the judge with large sympathy and small experience with the possibilities of the feeble-minded. These individuals do not look feeble-minded to the judge nor do they appear mentally deficient to most people. The popular conception of the mentally deficient person being that exhibited by the pictures in this article representing the idiots and imbeciles and not those representing the moron groups.

I once took before a court a colored girl whose mental tests showed her to be less than eight years old mentally, although she is twenty-one, and whose life history for years before coming to the institution was that of an individual at war with social customs and usage. She had been committed to the institution by another court and a writ of *habeas corpus* was served to procure her release. The judge is a man of considerable experience with juvenile court cases, a man of broad sympathies, and I had the utmost difficulty in convincing him of the grave danger to the community of turning such a girl loose, and this girl only ranks as an imbecile. Had she been a moron of the higher grade, I do not believe I could have convinced him.

The condition of mental deficiency, or, perhaps better, mental inefficiency known as feeble-mindedness, has no well defined line of demarcation from the normal; that is, beginning with the lowest grade idiot and going up the scale of mental ability we finally reach a point where it is very difficult even for an expert to say this person is feeble-minded or this person is normal, and I believe that really the last and final test most to be depended upon in these border line cases, lies in the question as to whether the individual is able to exist in the community in which he may be placed, and to observe sufficiently well the moral and social laws by which we are all governed. The mental condition known as feeble-mindedness is divided on the best accepted authority into three main divisions; the idiot, the imbecile and the moron. Each of these divisions is again divided into three: the high grade, the middle grade and the low grade idiot, imbecile or moron. The definitions generally accepted today are grouped approximately as shown in the table below:

Idiots	Low grade Middle grade High grade	One or two years mentally, inclusive.
Imbeciles	Low grade Middle grade High grade	Three to seven years, inclusive.

Plate I.

Morons. Girls taken in time and protected by the fostering care of an institution.

Morons	Low grade Middle grade High grade	Eight to twelve, inclusive.
Border line		Comprise those over eleven and below fifteen, who persistently react unfavorably to the ordinary restraints of society.

Between these sub-divisions there is no sharply defined line but the one grades very gradually into the other, so that between the high grade imbecile or middle grade imbecile there is sometimes so little difference that the individual might be classed by one examiner in one class and by another in the other. This, however, while it is not very accurate from the scientific standpoint, is of very little importance from the standpoint of treatment accorded to this individual; in so far as the relation of this individual to the public, an approximate estimate only is necessary to enable us to place him in the proper relation to society; but as we go higher in the scale and approach the normal, the question becomes more and more important to every one concerned, and the extreme difficulty of accurately determining in border line cases whether we have a true mental inefficient, may prove to be a tragedy for the individual or for the public or for both, if the wrong diagnosis is made. Within comparatively a few years, science has stepped in and made an attempt to help us out of these difficulties. Drs. Simon and Binet of France prepared a series of mental tests based on the careful psychological examination of a very large number of normal children of different ages, and these tests, known as the Binet and Simon tests, somewhat modified and revised by Dr. Goddard of Vineland, New Jersey, were introduced into this country a few years ago. They provide a series of graded tests intended to judge accurately the mental abilities of the individual by comparing him with the average mental abilities of normal children between the ages of two to fifteen years. This system of graded tests immediately attracted an immense amount of attention over the country, not only from the people dealing in work with the feeble-minded but also from psychologists, public school teachers, and social workers. The tests were immediately tried out by a very large number of these people, and the results reported were exceedingly diverse. Some people reported these tests as an unqualified success; other people, apparently as well equipped to judge concerning them, pronounced them an unqualified failure; and others, probably the wisest among the number, withheld judgment as to the real value

PLATE II.

Idiots. Capable of only a few simple tasks under expert direction.

of the tests until after there had been further study and experience in their use. These initial series of tests have been followed by quite a varied number of mental tests brought before the public and advocated by different psychologists and social workers. Modifications of the original Binet-Simon tests have been made. Dr. Goddard himself, after an experience of some time, modified somewhat the first tests put out, and this has been followed by modifications of Binet tests by other psychologists until in some cases but little is left of the original system. Other systems of tests have been brought to our attention; the most important of these are by Healy of Chicago, the Yerkes Bridges Point Scale, the De Sanctis, and various modifications of these as well as tests by other psychologists. There exists today a wide diversity of opinion as to the value of these tests. It is pretty generally conceded by psychologists now, that the tests are the least reliable as they approach the normal, but may be depended upon with a reasonable degree of certainty when carefully given by an expert, up to a mental age of ten years. The tests are a fairly reliable measure of the mental capacity of the individual at the time of taking the test, but after you pass the age of ten years in mentality less and less dependence as to the person's mental inefficiency can be placed upon the tests alone. In fact, Dr. Goddard, who introduced these tests, says himself that the tests alone are not completely satisfactory as a measure of the individual, that we must take into account other factors that have to bear directly or indirecly

PLATE III.

Morons. Not a boy here is capable of citizenship.

on the mental capacity of the individual such as heredity, the individual's reaction to social surroundings, his general physical and nervous makeup, his environment and habits. My personal belief is that these tests are an immensely valuable step forward in the diagnosis of feeble-mindedness in the human race, and that if we ever succeed in getting a reliable, legal definition of feeble-mindedness, one that may be depended upon in court and before the legal mind as definitely as the present status of insanity, it will come through the development and appreciation of these mental tests and their

PLATE IV.

Imbeciles. Capable only of simple industrial work under close supervision.

acceptance by the legal profession as something definite upon which to base a legal decision. But the greatest difficulty, as I have said before, lies in those cases above ten years in mental development and below fifteen. Here is a group not often found in institutions for the feeble-minded, not often recognized as defectives at least early in the course of life, who are far more dangerous to society, and far more dangerous to coming generations than all the idiots and low-grade imbeciles massed in our institutions. The girls, often handsome and attractive, go to fill our houses of prostitution, our industrial schools and women's prisons, or, if married, become the slovenly housekeepers and inefficient mothers of hordes of children, more or less defective than the mothers; more so, if the father is defective; perhaps less, if the father be without taint. Similarly the boys of this class become the petty offenders against the law. The boy repeating over and over again the offense that first brought him before the courts. If under favorable surroundings, he manages to make a living, the first real stress or strain of life, that would be only a stimulus or temporary setback to the normal man, overwhelms him completely. It is my personal belief that every chronic offender against the law, who has committed for the third or more times the same or similar offense, is a real defective and should be treated as such. Such an individual should be segregated from society; sterilized, if there is any prospect of escape from jurisdiction, that succeeding generations may be protected; put to work, that he may not be a permanent burden to society, and because work is the salvation of the whole human race whether feeble-minded or not, and made as happy as permanent segregation from society can be made.

It is quite impossible to make the general run of people understand to what depths of depravity even the best appearing of these border line cases may and many times do sink. Their good looks, their often glib answers to questions, their ardent professions of a true purpose to reform are very deceiving; but they are capable of the utmost and degrading kinds of vice, even homosexuality in its most repulsive forms; they are absolutely untruthful, if they think for one instant that their own interests will be furthered by lying, and often persist in useless lying when the simplest common sense judgment would show the folly of doing so. Nothing is safe from the thieving hands of this class, if they think there is a chance of escaping detection; indeed, the certainty of punishment will not deter them if the desire is sufficiently strong. This class marry and reproduce their kind in ever increasing numbers, more than twice the rate of increase of normal population.

The names applied to these people are many and varied, "defective delinquents," "moral imbeciles," "constitutional inferiors," "border line cases," etc.; but they all mean one and the same thing, an individual of fairly good appearance physically, but who is quite unable to adapt himself to the ordinary moral and social restrictions so necessary for good society, and who, though he may exist for a time in a favorable environment without antagonizing society, eventually will yield to the stress and strain of prosperity or adversity and, given the opportunity, become a second "Nero" or a complete outcast.

The whole matter of mental tests is yet in a developmental stage, and until there can be worked out a sufficiently careful and well graded series of tests that shall appeal to the majority of psychologists as scientifically dependable, and until the fact shall be generally recognized that the application of these tests must, to be satisfactory, be made by the highly trained expert, we shall not have reached the point toward which we are all aiming; that of accurate scientific diagnosis of mental deficiency accepted by the medical and legal professions as reasonably accurate.

The adoption by the U. S. Government of a series of mental tests not only for determining the men suffering from psychoses, but also those who have mental inefficiency, is a long step forward in the recognition of mental tests as determinative, and is also a testimonial from excellent authority that mental tests while perhaps not yet sufficiently well standardized to be complete or satisfactory to psychologists in general, yet have a definite value to the government in ruling the mentally unfit from the responsible position of a soldier. The soldier must obey quickly, the mentally inefficient cannot; the soldier must be trustworthy under severe trial, the mentally inefficient are not; the soldier must carry out an order intelligently, the mentally inefficient cannot. The government doesn't want him, society does not want him, nobody wants him.

The reason for the varied opinions regarding the value of these tests is a comparatively simple one. When the tests were first published by Dr. Goddard, attempt was made to apply these tests and interpret results by a large number of people, who were of very different grades of education and intelligence. The nature of the tests is such that, if the questions are not carefully and intelligently put to the individuals under examination, and if the answers are not interpreted with a very full understanding of the psychological problems involved, the results may be widely different. The tendency of different individuals with practically the same kind of training to make different interpretations of the results of these tests with respect to the same individuals is quite remarkable, but the great difficulty from the legal standpoint lies in the so-called border cases where even experts may and often do differ in their opinions, and where the results to the individual examined are so very serious one way or the other.

For some years in the institution which I have the honor to represent, the medical staff have made a practice of examining at a morning clinic every new case admitted to the institution. I do not mean that we apply at this morning clinic the Binet-Simon or other tests, but the new case admitted is brought into the office and friendly relations established with him, questions asked, and a general survey of the individual given. The personal descriptive blank and etiological history blank comes with him. These blanks are more or less complete, too often less, I am sorry to say, and sometimes practically nothing. We have adopted the plan of attempting at this time and with only this cursory examination to approximately grade this individual. This case is then sent to the department where in our judgment it belongs; in most cases in the school department, because admissions are mainly from six to sixteen years old and are entered in the school work, if capable of taking it. Six months to a year later this individual is again returned to the office; meanwhile a mental test has been made, the individual has been under observation in the school room or in the wards and a careful revision is now made of our original diagnosis. It is surprising how very close the original snap diagnosis agrees in most cases with the results attained after this period of study and acquaintance with the individual. I believe it is possible for a person, who has had an experience with a large number of mental defectives, when he has a fairly complete life history of the individual and a record of the ancestors and near relatives, and the individual himself before him, to make a sufficiently practical diagnosis of all cases of deficiency with a mentality under ten years, to be an accurate guide for deciding what shall be done with that individual from a social standpoint. This cannot be done with sufficient accuracy in the highest grade and border line cases of mental deficiency without careful mental tests. In this field you may have an individual, who passes the mental tests so well that even by the best trained examiner, he may be pronounced of normal mentality, and yet this individual, though in a favorable environment, may fail to measure up to the standard of behavior and conduct required by society in the normal individual; and perhaps for these border line cases the final test may eventually come to be the question of that individual's ability to live as a citizen under reasonably satisfactory social conditions, and perhaps the time will come when the chronic failure under favorable environment will be as certainly segregated from society and protected from himself as the idiot is now.

THE HAEMATOGENOUS INVASION OF THE CEREBRO-SPINAL AXIS IN POLIOMYELITIS.*

A Further Contribution to the Pathogenesis of this Disease.

By

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NO medical problem in recent years has more deeply engrossed the attention of the entire profession and more urgently claimed the best endeavors of the scientist than that of epidemic poliomyelitis. With successive outbreaks of steadily increasing severity, it has become clear that this disease is rapidly extending the scope of its ravages, and, striking as it does at the tender sinews of the larger metropolitan populations, it constitutes a menace of appalling gravity. Despite the unrelenting toil of the expert bacteriologist and the marvelous achievements of the experimental laboratory, we are still far from possessing a satisfactory knowledge of the nature, mode of transmission and path of ingress of the causative agent of poliomyelitis. Practically every phase of the subject is veiled in mystery and the object of considerable controversy. The identity of the virus is now differently countenanced by eminent bacteriologists; the pathologic histology has received widely discordant interpretations; the clinical evolution of the disease is characterized by a most disconcerting polymorphism, and thus far the treatment of the acute stage has not furnished very promising results. Nevertheless, there is reason to hope that immune serum may soon prove a powerful weapon. In view of its bearing on a rational employment of serum therapy, the mode of invasion of the central nervous system seems to me to represent not the least important feature of the vital problem of poliomyelitis.

The prevailing doctrine at the present time is that the causative virus of poliomyelitis, whatever it may be, enters the economy through the naso-pharyngeal mucosa, multiplies there, and, after a variable period, invades the brain and spinal cord by way of the lymphatic channels connecting the upper nasal chamber with the interior of the skull (i. e., along the olfactory route). This would account for the extremely common meningeal type of onset (headache, rachialgia, retraction of the neck, Kernig's sign, muscular twitching, transitory strabismus, mental dullness or stupor), and would find additional confirmation in the fact that the pia mater over the bulb and the base of the brain is regularly involved, even in those cases presenting no cerebral, bulbar or meningeal symptoms. Thus, implication of the ventral meninges of the brain and cord would be the initial lesion in poliomyelitis. This assumption does not appear to me to be substantiated either by the clinical evolution of the disease or by careful study of the lesions found in fatal cases.

A meningeal syndrome clinically, while far from constant, is certainly very common, but it does not necessarily indicate primary involvement of the basilar or ventral meninges. Most of the signs of meningeal irritation observed in poliomyelitis likewise occur in the so-called meningism which not infrequently characterizes the onset of various infectious diseases in children, notably scarlet fever, lobar or lobular pneumonia, typhoid fever, influenza, etc., and in all of which, as in poliomyelitis, the meningeal syndrome clears up usually in the course of a few days. We certainly will not speak of abortive meningitis in such cases. It may be objected that in poliomyelitis we have clinical evidence, furnished by lumbar puncture, that the

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*Read before the Section on Nervous and Mental Diseases at the Sixty-eighth Annual Meeting of the American Medical Association, New York City, June 4-8, 1917.

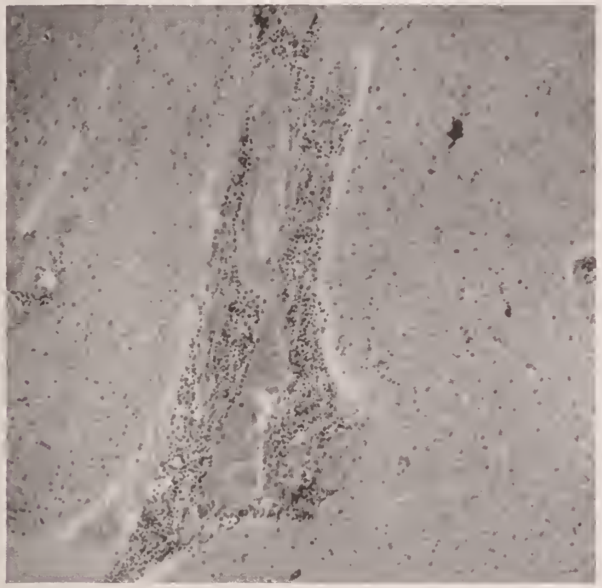

Fig. 1. Showing infiltration of pia mater in anterior median fissure.

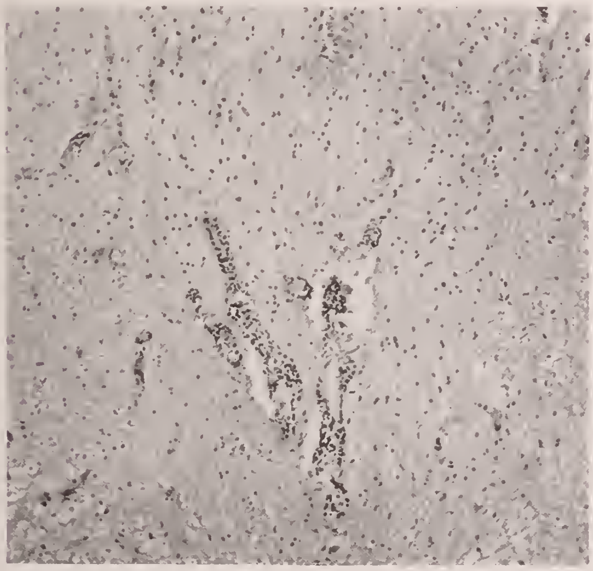

Fig. 2. Extensive adventitial infiltration of blood vessels of posterior horn.

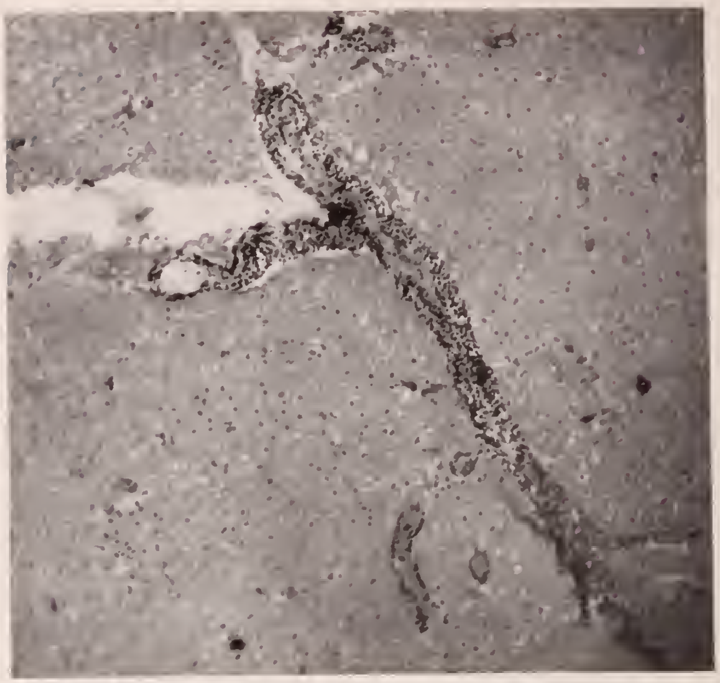

Fig. 3. Adventitial infiltration of blood vessels of posterior median septum with adjacent focus of circumscribed interstitial edema.

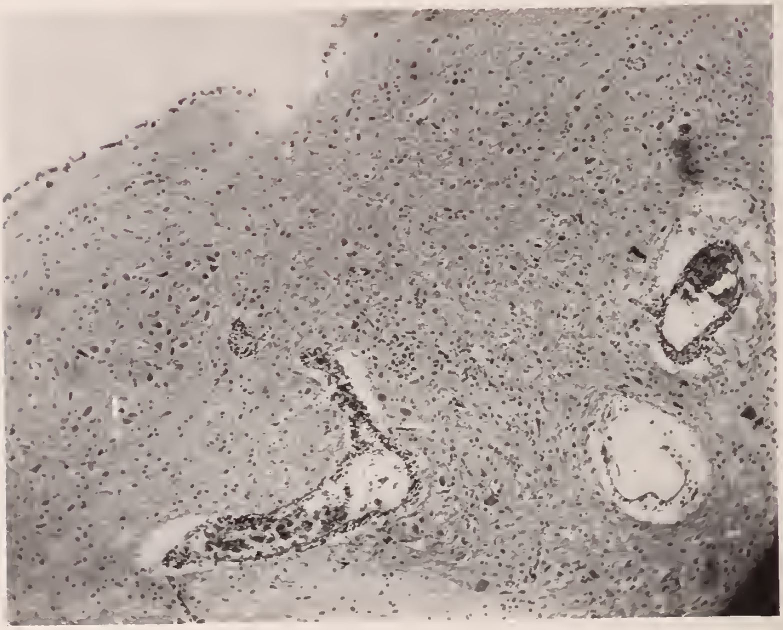

Fig. 4. Vascular lesions in sub-ventricular segment of formatio reticularis.

meninges are actually diseased, that positive findings in the cerebro-spinal fluid are encountered in the vast majority of cases. Let it suffice to state that a positive butyric acid reaction and a discreet lymphocytosis do not at all signify primary or active meningeal disease, particularly when lumbar puncture is performed, as it usually and almost necessarily is, after the child has already been ill a few days, or else when actual paralysis has appeared. Positive findings at this time simply prove meningeal implication, they do not establish the priority of the meningeal process. Is it not a fact, moreover, that in many cases the cerebro-spinal fluid findings are more accentuated after a week or ten days despite the clinical abatement of the meningeal manifestations? This is particularly true of the globulin reaction. It has recently been brought out that while the cells usually disappear after the second or third week, the globulin, which at first may be wanting, steadily increases until about the third week and then decreases. Furthermore, if meningism may occur without demonstrable changes in the spinal fluid, marked changes may occur in the spinal fluid in the absence of any appreciable clinical manifestations. This is already established as regards syphilis in which disease a positive butyric acid reaction and a definite lymphocytosis have repeatedly been observed in the very earliest stages, and a similar situation has been encountered in the course of the last epidemic of poliomyelitis. In a very recent contribution, Draper (1), speaking of the necessity of detecting meningeal involvement at the earliest possible moment in order to institute serum treatment, clearly states that, "In some instances the baffling phenomenon of greatly increased cell count without clinical signs of meningitis demonstrates the difficulty of the problem."

The pathological anatomy of poliomyelitis clearly indicates in my opinion that the histological changes in the cord and brain are not secondary to an initial meningeal invasion. My contentions are based upon careful and repeated study of the lesions in a series of only five cases, but in all of them the changes are identical, the only difference being in the level of maximum involvement. The pia and arachnoid are certainly diseased in poliomyelitis, in some cases the meningeal involvement attains considerable extent, but in all cases of our series and at all levels the meningeal process is directly proportionate to and infinitely less severe than the intra-medullary or intra-cerebral lesions. In contradistinction to the other definitely established meningeal lesions (epidemic, tuberculous, purulent and other forms of meningitis), the meningeal reaction of poliomyelitis is characterized only by tremendous engorgement of the blood vessels, even hemorrhagic extravasations in some cases, and by relatively discreet lymphocytic infiltrations. The only level at which a definite circumferential pial lymphocytosis was observed was in the lumbo-sacral region. At higher levels the meningeal infiltration was not uniform but rather more marked on the ventral aspect and in many places purely insular in type. There is no fibrin network and little or no endothelial desquamation. The meningeal process is also peculiar in this respect that at no level does it invade the underlying portions of the brain and cord and give rise exclusively to marginal foci. Wherever the pial infiltration is at all marked, extensive disorganization of the gray matter has already taken place. The foci of disease in the cord and brain-stem are deep-seated instead of superficial, and the perivascular lymphocytic agglomerations are most marked in the proximity of the central canal and in the deeper parts of the cord, the infiltration decreasing toward the peripheral or marginal zones and becoming almost exclusively intra-adventitial in the strict sense of the word. This statement evidently does not apply to the pial infiltration in the anterior median fissure at which point the pia mater actually dips down as far as the anterior commissure of the cord and here certainly the appearances are such that it is difficult to avoid the conclusion that invasion takes place essentially along the peri-vascular lymph spaces

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1. Draper: Acute Poliomyelitis: Early Diagnosis and Serum Therapy. *Jour. A. M. A.*, April 21, 1917.

accompanying the entering branches of the sulco-commissural vessels. But if the lesions in this particular area are perplexing, the same is not true of the changes encountered at other points of the circumference of the cord and especially in the higher cervico-dorsal and bulbar segments. To be sure, focal agglomerations of lymphoid cells are found in the pia, but they always stand in direct relationship to more or less horizontally coursing intra-medullary vessels, the neighboring pia is free or relatively so, the number of cells at the periphery is small, whereas the degree of adventitial found in the cord, the lesion in the gray matter being invariably an extension by continuity from affected bloodvessel sheaths which have traversed an infected pia mater." This assertion was not borne out by our observations and in different regions, particularly in the dorsal cord, extensive adventitial infiltration of the intra-medullary and perivascular lymphocytosis becomes progressively accentuated as the bloodvessel is followed more deeply towards the central gray matter. This was found to be the

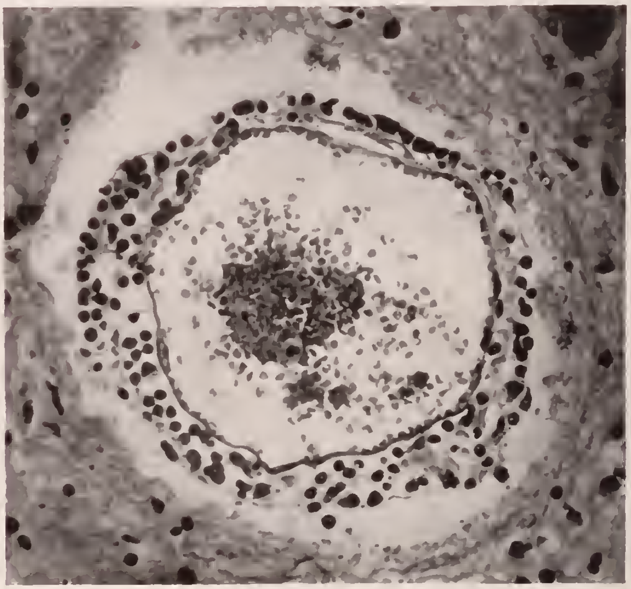

Fig. 5. Adventitial infiltration of vein in gray matter of bulb.

case with regard to the vessels related to the posterior horns and to the deeper parts of the lateral columns and suggested that the cells were possibly leaving instead of entering the cord. It has been maintained by some (2) that "no isolated foci are vessels was observed in the lateral columns and in the posterior horns without evident implication of the corresponding pia mater.

As regards the lesions found within the cord and brain-stem, they have been well described by others and it would be superfluous to detail anew the interesting and rapidly evolving chromatolytic changes in the multipolar cells of the anterior horns and the corresponding cells of the cranial nerve nuclei. I shall insist, however, upon the character and distribution of the vascular and interstitial lesions. In the cord they are most marked in the central gray matter ventral and lateral to the central canal and in the anterior horns, but they are equally present and sometimes well marked in the posterior horns and in the deeper parts of the lateral columns. The lesions consist

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2. Frauenthal and Manning: A Manual of Infantile Paralysis. Philadelphia, 1914, p. 83.

mainly of exaggerated adventitial and perivascular lymphocytic agglomerations (particularly about the veins at certain levels) and equally well marked interstitial lymphocytosis; the perivascular lymph spaces are usually distended and the parenchyma itself in many places has the peculiar cribriform appearance of rarefaction or vacuolization seen in incipient myelomalacia and encephalomalacia. In one of our cases actual foci of softening were observed in the lumbar enlargement and occupied at one level the greater part of the posterior horn. The capillaries and small veins are often choked with red blood cells and minute hemorrhages are not uncommon, but actual thrombosis of the smaller arterioles in our cases could not be positively demonstrated. Within the cord and brain-stem the behavior of the perivascular lymphocytosis seemed to me to vary materially at certain levels according to the character of the blood-vessel. While the arterioles hardly appeared more prominent than normal and the adventitial infiltration could be followed *en masse* within the neighboring parenchyma, the veins were more or less markedly distended and enclosed by a lymphocytic cuff of relatively uniform thickness which did not merge into surrounding infiltrations of proportionate density. In the brain-stem the vascular lesions in point of character are absolutely identical but are found mainly in and about the various nuclei, both motor and sensory, situated in the subventricular segment of the formatio reticularis, though likewise along the course of the central branches of the so-called root arteries (supplying the nucleus ambiguus, the facial nucleus, etc.). Hemorrhages were seen in two cases in the pia covering the dorsal aspect of the medulla, but otherwise the meningeal reaction at this level was far less marked than in the spinal pia. The lesions observed in this series of cases correspond in general with those described by others in carefully reported cases. A fact which stands out prominently is that the lesions, in point of topography, coincide in the cord almost absolutely with the distribution of the anterior and posterior spinal arteries, and in the brain-stem with that of the posterior inferior cerebellar arteries, though likewise with that of the radicular branches of the basilar

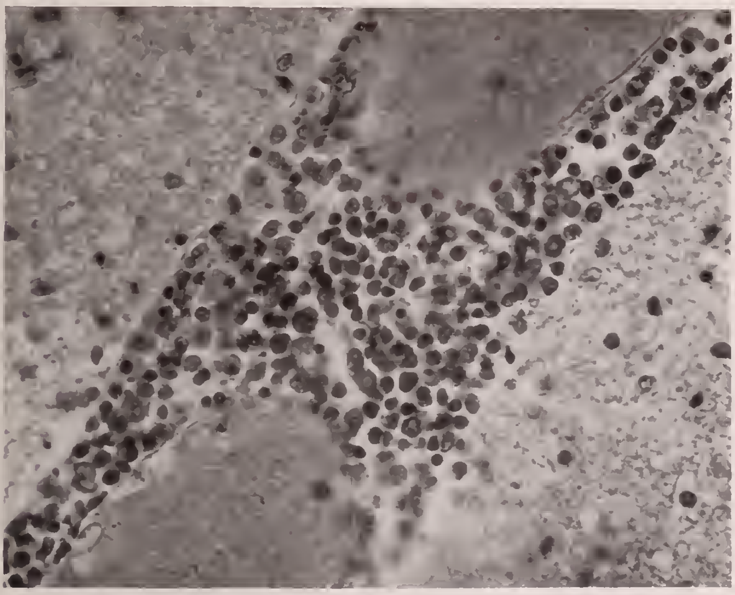

Fig. 6. Showing cell types occupying adventitial sheaths of blood vessels.
Most cells are lymphocytes and polyblasts.

artery. All these arteries, though reinforced below by branches from other vascular trunks, are derived on either side from one parent arterial stem, the vertebral artery. It seems that this should suffice to definitely establish the fact that in poliomyelitis the brain and cord receive the infectious agent through the blood stream and in no other way. This alone would fully explain the massive paralysis of all four extremities not infrequently observed in less than twelve hours. In some cases the virus evidently gains access predominantly to the internal carotid artery instead of the vertebral, and then we have the cortical or encephalitic type of poliomyelitis (identical with Strümpell's acute hemorrhagic cortical encephalitis).

Naturally, if an infectious agent enters the blood stream, it is carried to all parts of the system and it is well established that in poliomyelitis the entire central nervous system is involved, lesions being found in the cerebral cortex, the basal ganglia and the cerebellum, as well as in the pons, medulla and spinal cord, and this fact was borne out in three of our cases in which these regions were examined. The fact remains, however, that while the maximum destruction may occur at any given level of the cerebro-spinal axis, clincal observation and histologic examination both show that in the great majority of cases the lesions affect with especial predilection the cord, medulla and pons, in varying proportions, and therefore in point of distribution coincide most strikingly with the arterial irrigation. This localization is evidently governed by regional predisposition and possibly also by posture. It is perfectly conceivable, indeed, that a virus circulating in the blood will attack by preference regions rendered more vulnerable by reason of overactivity and functional exhaustion and will collect at points which receive a greater volume of blood or at which the circulatory exchanges are physiologically retarded.

It was noted above that the parenchyma in the cord and brain-stem exhibits very much except in milder degree the same appearance that characterizes acute softening, and yet there is no evidence of gross vascular occlusion either by thrombi or emboli. A mechanism, however, which must be seriously considered is the part played by that much neglected organ, the sympathetic system. I will simply draw attention to the fact that in poliomyelitis the lesions in the cord are most severe in front of and lateral to the central canal, and, in the brain-stem, in the subventricular gray matter, that is to say, exactly where we localize the cell complexes giving origin to the medullated fibres which accompany the outgoing root filaments to then join the sympathetic ganglia. It must be remembered that a double interchange probably exists between these structures, and that non-medullated fibres course in the opposite direction, *i. e.*, from the gangliated cord to the spinal ganglia and perhaps to the central gray matter. One of the functions of the sympathetic ganglia is to furnish non-medullated plexuses which entwine about the larger arterial trunks and accompany them to their final ramifications. The plexus surrounding the internal carotid has not only been followed to the cerebral and ophthalmic arteries, but it has been traced on to the pia mater. Similarly the plexus accompanying the vertebral artery is prolonged around its bulbar and spinal branches.

If we consider that a virulent agent like that of poliomyelitis is suddenly thrown into the cerebro-spinal circulation and floods the central gray matter over massive extents, it is easy to conceive how great must be the irritation communicated to the sympathetic apparatus and how severe and widespread the reactive vascular spasm thus occasioned in the ramifications of either the spinal or bulbo-cerebellar branches of the vertebrals or even in both arterial sets at the same time. This vascular spasm is evidently of sufficient severity and duration in some cases to determine the secondary circulatory disturbances seen in actual arterial occlusion, and gives rise to the same venous reflux or engorgement with consequent transudative oedema and even meningeal and intra-medullary extravasations. That this actually takes place in poliomyelitis seems to me definitely shown by the general swelling and oedema of the cord and brain-stem and even of the entire encephalon, in some cases at least, by the presence of generalized congestion of the meninges, the distention of the intra-medullary veins and capillaries, the occurrence of extravasations previously noted and the recoil of blood even into the larger arterial branches at the level of the cervico-bulbar region. In this connection, it must not be forgotten that the veins of the central nervous system possess no valves and that it is not unusual to find blood in the spinal arteries, particularly in the dorsal and lumbo-sacral regions, and perhaps I have exaggerated the significance of this particular feature. No theory can account for the not infrequently abrupt, almost apoplectiform, onset of coma or of quadriplegia with subsequent integral recovery of cerebral function or minimum residual palsy of one or two extremities except severe oedema of the cerebro-spinal axis due to widespread vascular spasm.

Viewed in this light, the meningeal reaction of poliomyelitis is simple enough to classify; it is largely a passive, reactive or secondary process following the initial deposition of the poliomyelitic virus within the cerebro-spinal gray matter. The tremendous engorgement of the spinal blood vessels gives rise to transudation of serum, sometimes to hemorrhagic extravasations. The polynuclear leucocytes and then the lymphocytes may likewise migrate from the interior of the pial vessels, but it must not be forgotten that they can secondarily reach the subarachnoidean space through the perivascular lymph channels and that the subarachnoidean space partly represents the eliminative path or emunctory of the cerebro-spinal axis. Furthermore, the pia mater has its intrinsic blood supply and must necessarily be involved to some extent in any infectious process invading the cord and brain through the blood-stream. In this respect poliomyelitis is comparable in a certain measure to lobar pneumonia in which some implication of the pleura, almost the rule, furnishes the first symptomatic features. The presence of the butyric acid reaction and of discreet lymphocytosis requires no further explanation in my opinion.

If involvement of the leptomeninges is the necessary initial lesion of poliomyelitis, why are the intra-medullary veins so distinctly more implicated than the arterioles when in reality their adventitial spaces are both continuous with the subarachnoidean cavity, why are the posterior meninges of the cervico-dorsal region so slightly affected in striking contrast to what occurs in the various forms of meningitis and why do the nerve roots practically escape in most cases? If the olfactory route represents the usual path of invasion, why is optic neuritis such an exceptional finding and oculomotor palsy so rare in comparison with abducens and facial involvement? We should expect more frequent participation of the large subarachnoidean cisterns at the base of the brain. It is difficult to reconcile the lymphogenous theory and the progressive proliferative adventitial process with the generalized congestion and distention of both the meningeal and intra-medullary bloodvessels. It seems to me impossible to account for the polymorphous clinical aspects of poliomyelitis on the basis of primary meningeal and lymphatic involvement. The isolated paralysis of the lower or upper extremity or of the facial or abducens in one case, the ascending or descending progressive type in another, the bulbar form in a third, the cerebellar or cerebral cortical variety in a fourth, shows to what extent localizations may differ and this hardly conforms to the doctrine of progressive lymphatic invasion. The hematogenous route, on the contrary, appears to me to fully account for all the apparent discrepancies. The virus in reality reaches the entire vascular domain of the cerebro-spinal axis, but it is arrested and exerts its pathogenic influence wherever it encounters weakened and predisposed cell-complexes and in this it is aided by regional circulatory stasis. There is no strong argument against this hypothesis for it is proven that considerable infiltration occurs at certain levels of the brain-stem and cord without having given rise to paralytic disturbance. Whatever may be the reason the poliomyelitic virus has a selective affinity for the larger motor cell-groups and the most economical way of reaching them is through the blood-stream instead of by the long retrograde path of the lymphatics in contravention of all anatomic and physiologic provisions. I have previously called attention (3) to the fact that the deposition of the causative micro-organism of poliomyelitis within the cerebro-spinal axis is favored by the peculiar structure of the blood vessels found within these viscera. Not only do the arterioles contain adventitial lymph spaces, but the capillaries are extremely minute, often devoid of a muscular coat and represented merely by endothelial tubes surrounded by wide lymph spaces without definite limiting walls. Furthermore, the perivascular lymph spaces are continuous with the pericellular spaces and these in turn send filiform channels within the interior of the larger nerve cells, known as the canals of Holmgren. When all these facts are taken into consideration, and finally when we note that in a large percentage of cases the paralytic disorders develop sometime during the night when there is a natural or physiological stasis in the more dependent parts of the body and particularly in the dorso-lumbar region, it is evident that ideal conditions are realized for the reception of the poliomyelitic virus within the bulbo-medullary parenchyma. While I believe that the virus has a definite or specific affinity for certain structural elements of the nervous system it should be again stated that in poliomyelitis lesions do occur in other organs and this has been strongly emphasized by the Flexner school. In the Bender Laboratory autopsy records we note distinct enlargement of the retroperitoneal glands, necrotic changes in the liver and marked congestion in the lungs, the spleen and the kidneys; the latter are possibly due in part to disorders of vascular and secretory innervation resulting from the intense sympathetic irritation previously discussed. As regards the posterior spinal ganglia, they have been found diseased in a number of cases and definite lesions were present in two of our cases. The lesions here consisted of hemorrhagic extravasations in the fibrous capsule and of degenerative changes in the ganglion cells but without apparent lymphocytic infiltration. Extensive lymphoid infiltrations have been repeatedly observed by others, however.

As regards the nature and derivation of the infiltrating cells in poliomyelitis there always has been and still is considerable diversity of opinion. Many observers agree that they are migrated leucocytes, but the fact is that in our series of cases typical polymorphonuclear leucocytes were exceptionally few. Many cell types were encountered in the diffuse infiltrations of the gray matter of the cord and particularly so in the anterior horns but the larger proportion of them resembled either simple lymphocytes or else somewhat larger forms with less deeply staining nuclei and more distinctly visible cytoplasm. This cell corresponds to what Maximov has described as polyblasts. At certain levels other cells with peculiar crescentic or hook-shaped nuclei were quite numerous, but I could not decide whether they were really polymorphonuclear leucocytes or proliferated gliar elements though the latter probability seemed to me more logical. Larger cells of a distinctly endothelial morphology were likewise present, but in relatively small numbers. I believe that the small rounded mononuclear cells are migrating lymphocytes derived from the blood-stream, but whether this is equally true of all the cells found in the adventitial infiltrations is hardly admissible and I rather incline to the view held by Goldscheider and Strauss that they represent, in part at least, proliferated fixed tissue elements. The vascular irritation is too severe in poliomyelitis not to give rise to reparative reaction and the cicatrix invariably shows much thickened bloodvessels. Nevertheless I firmly believe that a fair proportion, if not most, of the small mononuclear elements of the adventitial infiltration are purely migrating cells derived from and returning to the blood-stream. In one of our cases, I had the good fortune of finding at various levels, namely in the subcortex of the Rolandic region, in the pons, the medulla and the cervico-dorsal cord, particularly within the parenchyma but also in the pia, a number of small vessels in

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3. Archambault: The Haematogenous Invasion of the Cerebro-Spinal Axis in Poliomyelitis. *Albany Medical Annals*, January, 1917.

which an unusual number of white cells were present, some of them polymorphonuclears but most of them lymphocytes and larger cell forms such as described above under the name of polyblasts adopted by Maximov and Wickmann. There could be no doubt about the correctness of the interpretation, as the vessels were mostly cut transversely and the white cells were surrounded and separated from one another by red blood cells. This finding seems to me to throw considerable light upon the genesis of the perplexing physiognomy of the lesions observed in poliomyelitis and substantiates my contention that the infiltrating cells are derived in large measure at least from the circulating blood.

My own studies both of the clinical evolution and of the pathologic histology of poliomyelitis while decidedly meagre in comparison with the remarkable work done by others have led me to look upon the disease as a systemic infection in which the virus, whatever may be its port of entry, is carried first to the lymphatic system and then liberated into the circulation either in one massive dose, or, what is more probable, in a more or less steady stream during a variable period. It is my belief that the virus is carried to all parts of the central nervous system, not necessarily in even proportions, and that it exerts its deleterious action only at such points as have been rendered vulnerable by reason of predisposing functional hyperactivity or possibly by antedating traumatism or peripheral disease affecting the related innervation zones.

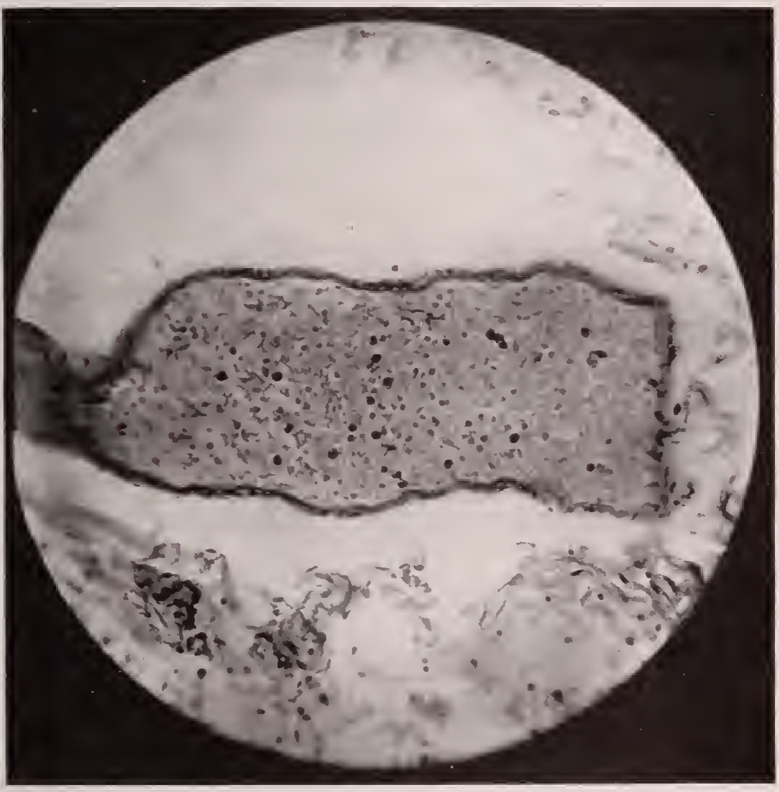

Fig. 7. Blood vessel containing an unusual number of white blood cells, most of which are lymphocytes and polyblasts.

In other words, we cannot dismiss the influence of extrinsic disturbances upon the intrinsic localizations of central nervous disease.

I fully recognize the almost puerile simplicity of the hypothesis which I have advanced in explanation of the pathological anatomy of poliomyelitis, but it seems to me to fully account for most of the clinical and histologic features of the disease. It explains the inconstancy of a meningeal syndrome and the high cell count in cases in which this syndrome is totally wanting and affords a logical reason for the fact that in cases of only two or three days' duration the lesions are already disseminated throughout the entire cerebro-spinal axis. The early irritation of the central sympathetic centers accounts for the widespread oedema and the intense congestion of both the meningeal and intra-medullary bloodvessels as well as for the rapid changes in the cytologic formula of the spinal fluid, which, from an almost pure polynucleosis in the pre-paralytic stage, becomes a lymphocytosis with the advent of local paralysis. As the oedema subsides and readjustment of the circulatory exchanges takes place, the migrated cells are no longer crowded out into the subarachnoidean space along the adventitial sheaths of the emerging veins but gradually re-enter the bloodvessels and hence the negative cell-count observed after three weeks or so. Finally, in support of my view that the central gray matter is first involved in poliomyelitis, it may be mentioned that many of the symptoms regarded as prodromal or preparalytic manifestations are of such a character as to strongly suggest primary invasion of the deep bulbo-cerebellar and medullary parenchyma, namely fibrillation and muscle tremor, profuse perspiration, absence of the knee-jerks, ataxia, tachycardia and tachypnoea, occasional retention of urine and constipation. Likewise the initial vomiting and the drowsiness may be symptomatic of central nervous involvement. Even the diffuse pains in the extremities and about the joints as well as the hyperaesthesia may signify an early implication or irritation of the cell-complexes of the intermediate gray matter giving origin to the spino-cerebellar and spino-thalamic tracts. As regards the frequent rigidity of the neck, it is itself easily explained by the haematogenous theory, inasmuch as the posterior meningeal artery supplying the falx cerebelli, the bones and membranes of the posterior fossa, is a direct branch of the vertebral artery.

Conclusions.

1. The virus of poliomyelitis is carried into the central nervous system through the blood-stream and predominantly into the area of distribution of the vertebral arteries.
2. The virus exerts its deleterious action upon the nervous tissue in part as the result of local toxemia and in part as the result of vascular disturbances due to direct irritation of the sympathetic apparatus.
3. The infiltrating cells in the pia mater, the adventitial sheaths of the bloodvessels and the central gray matter are mainly lymphocytes and polyblasts derived from the circulating blood.
4. The lesions within the cord and brain-stem are not secondary to the ventral meningeal infiltration. This appearance is simply due to the severe vascular disorders which follow the initial deposition of the virus within the central gray matter, the migrating cells either leaving the bloodvessels before the latter have penetrated into the parenchyma or being secondarily crowded out into the subarachnoidean space as the result of the widespread circulatory stasis.

DIAGNOSTIC FEATURES IN CLINICAL TYPES OF THE FEEBLE-MINDED.

By

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THE object of this paper is to present a ready differentiation of the clinical types of the feeble-minded, namely idiocy, imbecility, and the moron. It is not my purpose to discuss the merits of the well-known Binet-Simon tests for the determination of the psychological age of an individual. These tests are of great value when the individual applying them has much experience and intelligence, but for ordinary use and in cases where an immediate diagnosis is required, as in forensic cases, consume too much time in their application. In skilled and patient hands these tests are indispensable, but they frequently lead to errors unless they are judiciously applied. In the higher grades of the feeble-minded, as in the moron group, they may fail entirely.

As is known, the idiot is marked by a greater degree of mental enfeeblement than the imbecile, and is incapable of learning. The imbecile can be made to understand and is capable of rudimentary education. In the moron the intellectual development is on a higher level than that of the imbecile and he can acquire knowledge and be benefited by education. Within this clinical group, the feeble-minded, there is arranged a complete ascending scale of various degrees of physical and mental development from the lowest grade of idiocy to the highest grade of the moron and the three stages of mental development can be readily estimated by the following considerations:

1. *Idiocy.*—In idiocy the perceptions so long as no complications exist, as retinitis, optic nerve atrophy, anomalies of refraction, etc., are normal. The deficiency in the motor reactions to sensory impressions does not usually depend upon hypaesthesia, but upon a diminution in the acquisition of attention. The perceptions of the idiot leave behind no memory pictures or only very few, which remain no longer than a few minutes. As often as persons meet him and objects are shown to him, the memory pictures do not impress him. No alteration of the facial expression indicates that the one percept has often been met with by him, and others never or rarely. His nearest relatives, his clothes, his bed, he does not recognize again. He distinguishes no colors, generally also no foods. The memory pictures which are indispensable for the distinguishing of percepts, are absent in him. Only in somewhat higher grade idiots are individual concrete memory pictures at times found. These are generally optical. A laughing expression indicates that they recognize the light, the soup, the clothing, that are shown them.

Expressed ideas, acoustic as well as motor, are entirely absent in the idiot. At most he, like the trained animal, learns to make definite movements in response to certain calls. Idiots standing somewhat higher, resort to a few speech movements corresponding to their possession of concepts.

The capability of apprehension is always greatly disturbed. Idiots almost never recognize again, since memory pictures are absent in them. The attention is also greatly disturbed. There are many idiots who do not turn around at the loudest noise behind their backs even though they are proved not deaf. An associative connection and accordingly an outflow of concepts do not occur in idiots. A stream of ideas is wholly absent in them. The sensorial feeling-tones are frequently entirely abolished. Thus in the majority of idiots, a complete analgesia exists. Often hunger and satisfaction are accompanied by no feeling tones. The sight of glistening objects appears also at times to be accompanied by a positive tone of feeling. Sexual voluptuous sensations are frequently present. To these the occasional sexual assaults are to be attributed. Intellectual feeling-tones are entirely wanting. Corresponding to the poverty of the emotions, the movements of expression, of laughing and crying are almost absent in extreme idiocy.

The conduct and action is greatly disturbed in idiots. Only movements of eating are present in some cases. In higher grade idiots the fixation of the attention upon glistening objects also occurs. Others stick everything in their mouths that lies within their reach. Only a few idiots learn to stand and walk. For this reason they never become accustomed to cleanliness. Many idiotic children do not even learn to nurse the mother's breast. In idiots, the automatic acts are developed most strongly. Many wag their heads or bend their bodies in this or that direction day in and day out. An impulsive masturbation, *i. e.*, not accompanied by any kind of concepts, also appears, at times, at the age of four or even earlier. In somewhat higher grade idiots, conscious onanism and sexual attempts occur later.

Among the physical symptoms the so-called signs of degeneration stand foremost. This is explained by the fact that idiocy frequently develops upon the basis of severe hereditary degeneration. They are quite often found, however, also in cases in which hereditary taint plays no rôle. Among the individual signs of degeneration abnormal formation of the sexual organs is found particularly frequently. One testicle very often remains in the abdominal cavity, or more frequently lies in the inguinal canal, or both may fail to descend; or the testicles may reach the scrotum but remain small and undeveloped. In other cases the urethral canal opens in abnormal positions. Abnormal narrowing of the prepuce is also more frequent than in normal children. The frequency of these is important for the comprehension of the existence of idiocy, because they show that very often a severe general disturbance of the development of the organism lies at the basis of idiocy. The analogous malformation in idiot girls also exists. In many severe idiots, puberty is entirely omitted.

The following, Case 1, Figure 1, is one typical of idiocy:

Female, age 37, mental age 2. Filthy in her habits. Unable to wash and dress and incapable of any self-help in any way beyond feeding herself with a spoon. Is sluggish in her habits. Patient is susceptible only to a very few and simple impressions. Is a mute and capable of giving only a few expressions through signs. Can imitate to some extent. When shown a key she understands its application, as she will point to the key-hole, meaning that the key is intended to be placed in the key-hole. No trace of moral sense as she exposes her person and masturbates in the presence of others. Will be aroused at times by a very strong stimulus, as a bright light or the ringing of the dinner-bell at which time she gives some evidence of pleasure by the expression of her countenance. Does not recognize those about her and has no comprehension of the more complicated concepts. Patient is very irritable at times and becomes easily angered when displeased as is evidenced by crying out in a harsh, shrill tone, emphasizing her anger by stamping her feet and pounding on the door or wall. Attention is readily distracted to something new and is never concentrated on any one thing for any great length of time.

Patient presents many stigmata of degeneracy as dwarfism, mutism, asymmetrical development of the head and face, strabismus, high-arched palate and infantile uterus. She has an awkward and wobbling gait.

2. *Imbecility.*—The imbecile makes use of a great number of concrete memory-pictures. He distinguishes numerous persons, and often recognizes them again, even if the sensory impression has not been repeated for many weeks or months. The ordinary general concepts of the first order, table, knife, rose, paper, etc., are as a rule acquired, but the general concepts for the finer distinctions are not sharp enough. For example,

in the case of many imbeciles in spite of efforts for months one does not succeed in impressing the form of oak leaves and beech leaves. Both are mistaken again and again. The milder imbecile tends to learn the differentiation of the most important pieces of money. Red, yellow, white, black are generally distinguished; green, blue, brown and gray frequently not. The comprehension of numerals as a rule scarcely reaches 10, even when the patient is capable of counting mechanically to 100. More

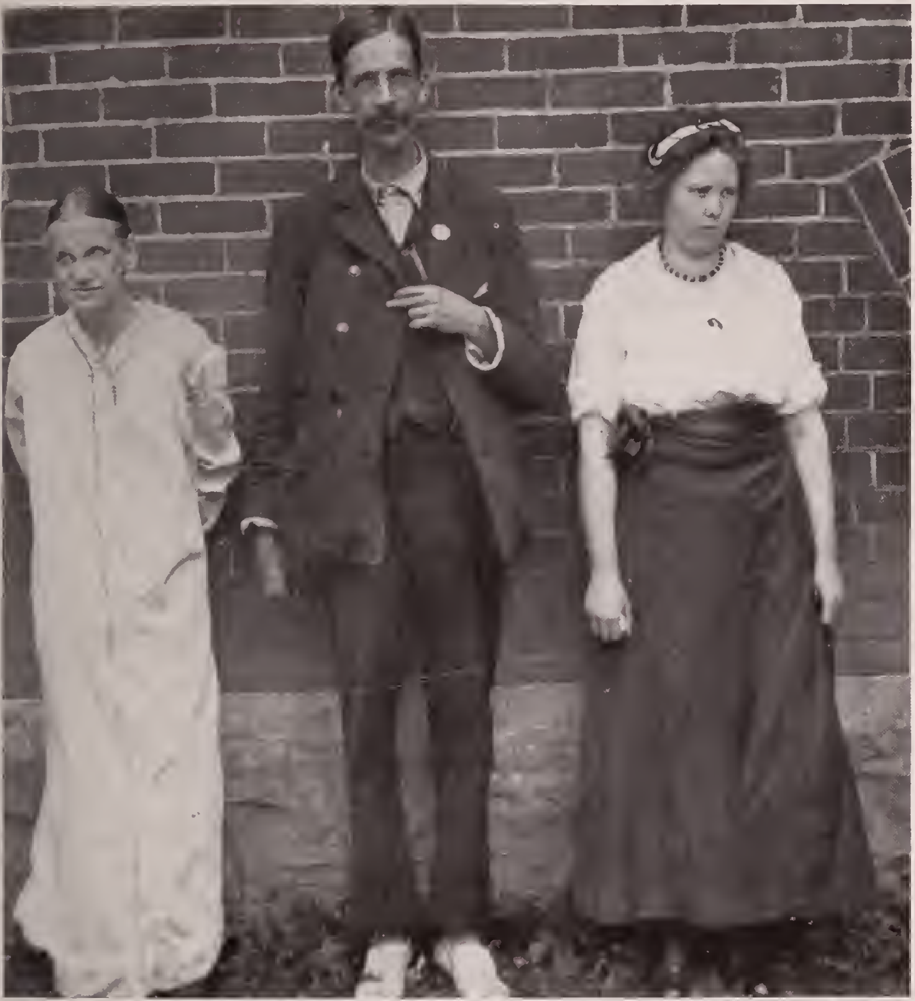

Fig. 1.

IDIOT.

Chronological age 37. Mental age 2 years. Stupid, violent temper, dwarfism, strabismus, microcephaly, facial asymetry.

Fig. 2.

IMBECILE.

Chronological age 40. Mental age 7 years. Does errands, employed in mattress factory, fond of display and egotistical, cathedral palate, asymmetrical head, face and chest, congenital heart defect.

Fig. III.

MORON.

Chronological age 23. Mental age 12. Neat, tidy, affectionate, obedient, employed in dining room. No marked anomalies in physical development.

combined concepts, especially the more abstract ones, are in general only acquired to a limited degree. Therefore, general concepts, concepts of a higher order, are usually absent. The incomplete development of the concepts of relationship is also very characteristic, such as resemblance, similarity, larger, smaller, later, earlier, cause, action. Comparative and superlative, modifying sentences with why, because, even, though, etc., prepositions as on account of, in spite of, etc., almost never occur in the verbal and written expressions, at least not with any sense. Questions with beginning word, why, and many similar ones, are often not understood. Corresponding to the greater concept-treasury, the imbecile also has at his disposal a considerable number of pictures of word sounds, and movements of speech.

Recognition is frequently almost normal. The capability of continuous attention is almost always decidedly impaired. Every sustained attention presumes the existence of goal concepts. These in part very complex goal concepts require that, throughout a long time, only one of many simultaneous percepts determine the course of the association of ideas. Goal concepts are entirely wanting in the imbecile, or they are too weak to gain any influence upon the selection of percepts. Therefore he is inattentive. Often every new impression diverts him.

The employment of special concrete ideas is limited to recognition and differentiation. The free activity of fancy, *i. e.*, independent of sensory impressions, is almost without exception, highly insufficient. Therefore, the dream life also is generally not very active. The judgment of imbeciles generally confines itself to the connection of percepts with simple concrete partial concepts and ideas, for example, rose red. Judgments which depend upon the association of many memory pictures and are independent of actual perceptions are infrequent. Addition is learned by many, subtraction very rarely, multiplication almost never.

The emotions in comparison with those of the idiot are very multiple, in comparison with those of the normal healthy individual, they are very monotonous. The patients laugh and cry frequently without motive. Disproportionately severe, or even quite motiveless outbreaks of anger are more frequent than in the idiot. The sexual feeling-tones are often increased, now and then perverted. Nearly all emotions are egotistical. Malignant joy and passionate revenge predominate throughout over sympathy and thankfulness. Affection towards relatives occurs, but is generally very superficial. The feeling of right and wrong does not exist. In high-grade imbeciles, in a certain measure, fear of punishment and the hope of reward takes its place. In the majority of imbeciles both of these emotions are very slightly persistent.

The actions of the imbecile, again in contrast to those of the idiot, are very multiple. Many imbeciles can follow a simple calling in a subordinate position. The consideration or play of motive is, as a rule, entirely wanting. In the rudimentary play of motive the concepts, in contrast to the percepts, have almost no influence. The actions as a consequence, have the appearance of impulsiveness. In a great measure they are influenced by imitation. This imitation, however, is generally entirely mechanical. The imbecile imitates but learns nothing by his imitation. Running away from home, vagabondage and begging are very frequent. Sexual acts have great forensic significance as paederasty, sodomy, attempt at rape, etc. Imbecile girls not infrequently give themselves over to prostitution, at times even before the age of twelve. Others entice men and afterwards declare before the court that they have been offered violence. In the anger emotions, brutal acts of violence and arsons frequently occur, *e. g.*, because of the refusal of alms.

The following, Case 2, Figure II, is one typical of imbecility:

Male, age 40, mental age 7. Congenitally defective. Understands simple language. Quarrelsome, self-willed, obstinate and at times displays considerable temper. Has become a dependable aid in the mattress factory. Power of speech and enunciation good. Accumulates trivial things as buttons, tobacco-tags, stamps, etc., and places a great value on them. Very limited vocabulary.

Recognizes primary colors but confuses blue and green, and knows the alphabet. Counts readily to 100. At times vulgar and profane. Has the idea that he is some great detective and is constantly trying to unearth some great crime. Numerous physical stigmata of degeneracy, as high-arched cathedral palate, congenitally defective heart, malformation of chest, asymmetrical development of the cranial bones, etc.

Difference between a door and a window? "Both open in a house." Water and ice? "One is cold." Dwarf and child? "The child is smaller." Table and chair? "You can sit down on them." Can reproduce number with four digits but not five. Can only name two flowers. "Roses and lilies." Difference between a flower and an animal? "Both grow, but animals walk." Lie and error? Negative. Box and basket? "The box is made of wood and so are some baskets." Bird and butterfly? "The bird sings but the butterfly does not." Can give months of the year. Does not know dates of prominent holidays. Knows Christmas is in December because it snows but cannot give the date. Masselon test: (Man, boat, river, fishing-rod.) "The man fished with the boat." Ebbinghause completion test absolute failure. Can name only two countries and four large cities. All that glitters is not gold? "Gold glitters." Word building test negative. Could not comprehend in detail the meaning of a simple picture in which a boy was riding a bicycle delivering groceries. Is unable to reproduce a simple story after repeated readings.

3. *Moron.*—In the moron constant perception disturbances are absent. Concrete ideas are present in normal quantity and quality. The more general and more concrete ideas also reach development in greater numbers. The treasury of knowledge of the majority of morons is quite large. The ordinary questions which physicians ask for the determination of the extent of knowledge are often correctly answered as the year of birth, place of residence, nationality, laws of the country, price of the ordinary provisions, simple historical dates, etc. In reference to these points, however, very much depends upon whether expert instruction has taken place. In school unequal functional capacity generally appears in the different branches. For an individual branch which requires no strikingly logical activity, there is sometimes considerable capacity. Generally the moron has at his disposal certain words, and uses them in certain phrase-like sentences which he has heard from others. The content remains foreign to him.

The activity of the fancy in the moron and even in the milder cases of imbecility is well developed. This explains the numerous memory deceptions and confabulations in connection with the intelligence defect.

Recognition is normal. The so-called recollection pertaining to sense is indeed often extremely sharp. Inability for continuous attention or concentration upon an object is almost always apparent. So far as abstract ideas come into consideration, the judgments of the moron are generally without criticism. Often the incapacity for self-judgment conceals itself behind a continuous citation. Against objections he persists with great stubbornness, but with little basis for these borrowed judgments. Above all, he overlooks the logical points of the objections which are opposed to him. Associations which depend upon a mechanical application of a definite rule succeed better with him. Thus, *e. g.*, many morons reckon rapidly and correctly. On the contrary, they miscarry in a complicated connection judgment. This character is to be demonstrated already in childhood. Here belongs also the fact that slightly moron children often learn to carry out correctly even complicated operations reckoning according to a definite scheme. In extraction of roots, etc., on the contrary, in spite of the endeavor of their teachers for years, they are not in a position to grasp the sense and the reasons for their methods of reasoning. Proof of geometrical problems a slightly moron child learns, of course by heart, but he does not understand the methods and the connection of the proof. The same holds true to stories: for example, short stories, historical events, his own experience. The idiot is not generally able to reproduce such, the imbecile produces them incompletely, generally only after numerous repetitions; the moron reproduces completely, but does not comprehend the connections and the points.

The sensorial as well as the intellectual feeling-tones at first appear normal. Only accurate observation teaches that many intellectual feelings are entirely absent, or are only quite rudimentarily developed. The moron makes use of the words "right, honor, patriotism," etc., but the ideas, *i. e.*, the partial concepts which associate with these words are very insufficient, the feeling-tones which accompany these ideas and should procure for them influence upon the actions, fail entirely.

The moron is capable of very complicated considerations and therefore also of very complicated actions. If the imbecile at times shows a certain shyness, in the moron this is often associated with a pronounced cunningness. Not infrequently he is a master of intrigues. Many have a distinguished talent. In their business activity the quality of the individual performance leaves nothing to be wished for. The deficiency of ethical ideas and feelings is manifest in the conduct of the moron even in the earliest childhood. Even in the earlier years of life, it is observed that such children tear all their clothing, destroy their playthings, onanize frequently, and without shame, and wilfully soil themselves, tease animals and their sisters and brothers, swear, scold, exaggerate, lie and steal. Often the purposelessness of the lying and stealing is apparent. All love affairs are extremely flighty. They are equally insusceptible to caresses, exhortations and punishments. For playmates they generally pick out younger children. Their deceitfulness and badness is apparent while at play. The most painstaking education does not master their pathological misbehavior. At puberty sexual misdemeanors increase. Frequently they run away from school or away from home. By phrases acquired by listening or learning by heart, and external routine, they often entirely conceal their condition in regard to the intellectual defect. The further development of life depends very much upon the social position. The moron son of the rich is never regular at his work, plays the elegant, resorts to playing, contracts debts, and occasionally robs the treasury of his superiors. The son of the poor early falls into vagabondage. Generally he reaches the path of the criminal, since a legal satisfaction of his egotistical emotions is impossible much earlier in consequence of his social position, which does not enable him to borrow and contract debts. The laws of custom and punishment are never more than a form of police order for the moron. A feeling of honor is only simulated quite incompletely by a certain vanity, and imitation of custom. Alcoholic excesses are general. With all of their desire of independence and with all of their over-estimation, the majority of the moron individuals are incapable of an independent manner of living.

Physical symptoms are frequently absent throughout. In other cases one meets quite the same symptoms as were found in idiocy and imbecility, generally, however, fewer in number and less pronounced. Speech is generally intact. Epileptic attacks are occasionally found in the moron. The characteristic physical symptoms of cretinism are only found extremely rarely, since cretinism generally appears under the picture of the severer forms, *i. e.*, idiocy and imbecility.

The following, Case 3, Fig. III, is one typical of the moron:

Female, age 23, mental age 12. Patient was somewhat retarded is school. She is cleanly in her habits and quite helpful in the dining-room work where she is a good, steady and quiet worker. She is very affectionate towards those to whom she has taken a liking, is docile and even-tempered and of a rather attractive personality, but when rebuked displays a violent temper. Dislikes music and has frequently requested that a piano on the ward be removed. Power of attention, imitation and memory good. Can sort colors normally. Has a fairly good vocabulary, but makes many grammatical mistakes in speaking and writing. Very sensitive and resents greatly any supposed slight and when she takes a dislike towards anyone does not overcome the prejudice. Has numerous delusional ideas, also numerous morbid ideas of a sex content. No physical stigmata of degeneracy.

Can designate colors correctly. Numerical reproduction test of six digits normal. Correct differentiation between horse and cow, box and basket, door and window, child and dwarf. Masselon test: Boy, woods, flowers, dog. "The boy took his dog and went into the woods and picked flowers." Simple Ebbinghouse completion test normal but retarded. Bourdon attention test slow but correct. Has difficulty in reproducing Ziehen's good girl story and was only able to do so after the fourth reading. Could add correctly a simple column of figures but had considerable difficulty in multiplication and division. Word building test fair. Ethical tests fairly good. Can define correctly, gratitude. What is patriotism? "To kill your enemy." Honor? "To be good." Burn the candle at both ends? "To keep the light burning."

There are various transitional forms, varieties and complications of the three types of feeble-mindedness. Between idiocy and imbecility, between imbecility and the moron, there exist no sharp boundaries. Mild idiocy coincides with severe imbecility, and mild imbecility with the severe moron. Since in individual cases, all concepts and association spheres are often not equally involved, it will often be impossible to class a case as imbecility as well as idiocy, or as moron as well as imbecility, according as to whether this or that concept, or association sphere is considered. Of much greater importance is the fact that gradual gradations lead from the moron to psychological limitation and on to the mentally normal individual. In the mildest form of moron, the defect of concepts is almost wholly confined to the more complicated and abstract general and relation concept, that is, very limited. Likewise the judgment defect is confined to the more complicated judgment combinations. The essentials of the defect very often lie in the field of the aesthetic and especially the ethical feeling-tones. The ethical concepts as such in this mildest form of the moron, reach development, but still are so far defective that they are not at all or so weakly toned in feeling, that they scarcely influence the association of ideas and the conduct. This mild form of the moron has therefore sometimes been inaccurately designated as moral insanity. This form then in a comprehensible manner, shows transitions, especially to those physiologically limited full-minded, which show moral depravity besides the psychological limitations.

Besides this transition form between the moron and psychological limitation, there are found other transition forms between the moron and the psychopathic constitution. Among the three forms of congenital weak-mindedness, the moron also arises particularly frequently upon the basis of severe hereditary taint. Therefore, it is comprehensible that between it and the hereditary psychopathic constitution, all imaginable gradations occur, or, in other words, the hereditary psychopathic constitution is combined with a greater or lesser intelligence defect in the sense of the moron, and the moron is often combined with the characteristic symptoms of stigmata of the hereditary psychopathic constitution. These transition forms, furthermore, also come partly within the realm of so-called moral insanity, that is, the lightest form of the moron shows ethical defects particularly often upon the basis of severe hereditary taint, and therefore quite often combined with the symptoms of the hereditary psychopathic constitution.

In the diagnosis, the recognition of the congenital mental weakness as such offers in general no difficulty. The intellectual defect is determined according to certain methods. The congenital character of the intelligence defect, that is the differentiation of the acquired defect psychosis, generally reveals itself immdiately by the anamnesia. If the latter fails, for example, in the case of tramps arrested by the police, who in consequence of their defect cannot themselves give an anamnesis, and about whom no knowledge is obtainable elsewhere, stammering, hemiplegias, and paraplegias with retardation of the growth of bones and deficiency in the number and color of concepts especially speak for a congenital defect. To this there is added that the judgment association as a rule in the congenitally mentally weak is pathologically single, and works with pathologically single concepts, while in acquired mental weakness the judgment weakness manifests itself preferably in the confused or incorrect attachment of more complicated concepts.

In the differentiation of the three forms of congenital mental weakness it is to be considered that, as above presented, between these forms sharp demarcations do not exist. Cases therefore will frequently occur whose positions remain doubtful. For the differentiation of the three forms, the intelligence defect as such is exclusively the deciding factor. It would be entirely correct, that is, to include a congenitally mentally weak child, or a congenitally mentally weak adult with cerebral infantile paralysis in the severer forms on account of this complication. In cerebral infantile paralysis one finds the most variable degrees of intelligence defect, from the slightest moron to the severest idiocy. Likewise, the so-called degeneration signs are not to be applied as a measure. Still closer lies the error of making use of the education of the speech as a measure for the degree of mental weakness. This also would be incorrect. In many cases the development of speech generally runs parallel with the development of the intelligence, but still not a few cases occur in which the parallelism is disturbed. One especially finds not infrequently, that the intelligence is relatively inconsiderable, but the development of speech in consequence of a special severe disease of the cortical centers standing in relation to speech, is very severely injured. Especially in the latter case, the intelligence defect is easily overestimated.

In general, idiocy is to be assumed, when the most ordinary concrete memory pictures are wanting. Imbecility, when the defect is confined especially to the differentiation of the concrete memory pictures and to the more combined and the more abstract general relationship concepts; and the moron, when only the most complicated and the most abstract general and relationship concepts and judgment associations have remained undeveloped, and especially the ethical tones of feeling have remained absent. It is, however, to be expressly emphasized that one dare never rely upon one or a few of the above mentioned symptoms in the enrollment of one mentally weak in the scale of idiocy, imbecility or moron.

Occasionally, the most striking combinations of severe defects are found with almost brilliant skillfulness. The diagnosis, therefore, can only be made upon the basis of the total picture of the intellectual and emotional life. Self-evidently, one will have to measure thereby his requirements of the intellectual and ethical states of possession according to the social position and environment of the patient.

The differentiation of the moron from physiological limitations presents greater difficulties, principally as mentioned, in that a sharp demarcation between the two does not actually exist. The wealth of abstract ideas, especially ethical ideas and corresponding ethical feelings in a measure for the differentiation occupying first place. The diagnosis in those cases in which the education has been deficient in the intellectual as well as in the ethical relationship is particularly very difficult. The difficulty then arises, whether the intellectual or ethical defect is pathological, and accordingly whether the moron exists or whether the defect is exclusively traceable to the deficient education. In general, one should only make the diagnosis of a moron if it can be shown that in spite of judicious educational atempts, intellectual and ethical development has not reached the average level and if accordingly it is determined that the individual is not able to acquire intellectual and ethical ideas in consequence of morbid organization of the brain In individuals whose education has been neglected, one will, therefore, always have to convince himself by his own endeavors that the person referred to does not possess this capability, that accordingly he would not have developed otherwise, or only slightly so by better education. The six weeks' institution observation required by law in some places in cases of doubtful capability of responsibility gives sufficient time to determine how much is traceable a deficient education and how much to a pathological organization of the brain, especially congenital mental weakness.

The greatest difficulties for the psychiatric judgment occur in those cases in which the abstract and ethical ideas as such are entirely developed and only the ethical tones of feeling are wanting. If one asks such an individual: "How does one call those who repay good with bad?" The immediately answer "ungrateful," and many on the contrary, to the question, "What is ingratitude," give immediately a satisfactory explanation of the idea. But the feeling tone of the ideas is entirely wanting. In the corresponding situation, the thankful feeling is entirely omitted in them. With the remaining ethical ideas, he behaves similarly. Such morons steal, even though they distinguish between mine and thine, because the feeling tones of the ideas of possession, the respect for the property of others, is wanting in them. How, then, shall one differentiate these pathological defects, which are associated with the mildest forms of moron, from those ethical defects which are brought about by improper education, necessity, passion and misdirection of opportunity in numerous normal individuals, *e. g.*, so-called criminals. It has recently been frequently stated that criminality is also a disease, *i. e.*, does not admit that the second named category is normal. In support of this statement it can be shown that in criminals the so-called physical signs of degeneration are found somewhat more frequently and hereditary taint can be demonstrated somewhat more frequently in the criminal than in the non-criminal mentally healthy. But these arguments do not hold good if they must prove that the criminal is insane. Physical symptoms of degeneration and hereditary taint also occur, without their being present any symptoms of psychical disease. The ethical defect, considered entirely by itself, cannot be designated as pathological without something further. Here, also, in behalf of the determination of its pathological nature it requires proof that ethical feelings would not have developed in a normal manner by better education, better associations and by other external conditions. Where this proof is not to be established, one may, of course, from other points of view, excuse the criminal with his neglected education, seduction by bad example and other conditions, hereditary taint and physical degeneration signs. Psychiatry in a narrow sense will not interfere, it is not in a position to express its vote for insanity, as long as hereditary taint has not also produced psychical disease symptoms, physical signs of degeneration, and has not shown that the ethical defect depends upon an abnormal organization of the brain. The differentiation of mild moron with preferable defect in the field of ethical feeling tones from the ethical defect of the mentally healthy, therefore has specially to take into consideration the following:

1. Proof of a defect not only of ethical feeling-tones but also of the ethical and other abstract ideas; at any rate that latter defect, *i. e.*, the intelligence defect which is very limited in the mildest forms of the morons.
2. Proof that ethical ideas and feelings tones could not and cannot fail to be present in the individual referred to, in consequence of his brain organization, that, *e. g.*, already in early childhood, quite independent of neglect, misleading and particular conditions, striking moralistic defect actions have occurred.
3. Proof of further psychical disease symptoms.
4. Proof of etiological disease factors. Hereditary taint, rachitis, focal disease of the brain, etc.
5. Proof of physical abnormalities, malformation of the skull, individual epileptic attacks, etc.

The proof under one and two is indispensable for the diagnosis of the moron, the proof under three to five in some rare cases cannot be obtained.

The proof under two is self-evidently often not easy to be obtained. For this very accurate observation is required. One must, therefore, never give a certificate upon the basis of one or two observations in regard to such cases. Finally, it is always to be kept in mind that mixed and transitional cases occur between the moron and the morally defective.

With the diagnosis of imbecility or the moron the work of diagnosis is not to be looked upon as settled. It requires also the determination which etiological factors for idiocy or imbecility or moron exist. This determination is of the greatest significance for the prognosis and treatment. One here pays special attention to hereditary syphilis, rachitis, and focal diseases of the brain. Finally, cretinism and other diseases are also to be especially thought of in this. One must never neglect the most painstaking and repeated examination of the thyroid gland.

The differentiation from the so-called psychopathic constitution is much more easily made. The differentiation here depends especially upon the presence of a defect.

Unequal endowment is also frequent enough in uncomplicated psychopathic constitutions, but in no field does there exist a defect. In the moron the one-sided endowment reveals itself always as a special and mere mechanical virtuosity, and the defect is never absent. It is, however, to be observed, that very often the moron and the psychopathic constitution are combined.

Finally, in review of the facts mentioned, the danger is very great that in a melancholia, mania, paranoia, etc., which have developed upon the basis of a congenital mental weakness, the latter may be overlooked; it is, therefore, forcibly recommended that the physician in every psychosis by some short questions inquires after the intellectual capability, before the outbreak of the present psychosis, as the age of learning to speak, school accomplishments, etc.

A STUDY OF PARAESTHESIA.

By

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THE term "paraesthesia" indicates an abnormal quality of sensation subjectively interpreted. An analytic investigation of this definition suggests the following queries: What is the present conception of normal sensation as to its nature, its varieties, its pathways, its efficient stimulus, and its cortical reactions? In paraesthesia is the abnormal quality of the sensation due to abnormal stimulation of the end organ, to irritation of the pathways, to functional or organic changes in the receptive apparatus in the brain, or to errors in judgment on the part of the patient in his mode of interpretation; or may all of these factors enter into the production of the phenomenon? Has the symptom, paraesthesia, any value in diagnosis, or in cerebral localization?

The Nature of Normal Sensation.—Normal sensation postulates a peripheral sense organ upon which a stimulus acts, a pathway for the conduction of the resulting nerve impulse toward the brain, and a cortical center through which is mediated the reaction in consciousness. Although all sensation is aroused in the brain itself, we are ourselves unconscious of this fact, and project our sensations either to the exterior of the body, or to some bodily organ, where experience has taught us the efficient stimulus arises. This method of projection has given rise to a classification of sensation into exterior senses and interior senses. The exterior senses include sight, hearing, taste, smell, pressure and temperature. The interior senses include pain, muscle sense, sensations from the semi-circular canals and vestibule of the internal ear, hunger, thirst, sexual sense, fatigue, and the more or less indefinite sensibility referable to the viscera. Each variety of sensation is dependent upon the adaptation of its own particular peripheral end organ for the reception of definite stimuli, which are termed efficient. Thus, light waves are efficient stimuli for the rods and cones of the retina, but inefficient for the hair cells of the cochlea. However, certain artificial stimuli may be rendered to a degree efficient. Thus pressure on the eyeball (mechanical stimulus), or an electrical current applied to the eye, arouses a sensation of light. Such stimuli really constitute abnormal modes of excitation of the peripheral end organ, and doubtless have an important bearing upon the production of certain types of paraesthesias. Further, a sensation may arise when neither the eye nor the optic nerve is stimulated, as when the seat of visual sensation in the brain is directly stimulated, as by variations in blood supply, by direct trauma, by toxic action, by pathological growths, or possibly mediated from the higher parts of the brain. Here lies the explanation of many types of visual hallucinations. Auditory hallucinations may have a similar mechanism, as in one of my cases of Jacksonian epilepsy following trauma, in a man of fifty, who frequently, preceding a seizure, would suddenly hear the most entrancing music. Sometimes one instrument would produce a familiar melody, while at other times a whole orchestra would play.

It is evident, therefore, that the character of a sensation cannot agree in any way with the external cause which produces it, but receives its specific character because of the cerebral termination of the afferent nerve. We must admit that if any peripheral end organ is adaptable to a number of stimuli of varying character, a nerve impulse will be inaugurated. This impulse is the same in its every quality, no matter what the nature of the stimulus which aroused it, and no matter what pathway it traverses. The passage of the impulse may be objectively demonstrated by the action current in any sensory nerve, and constitutes the only objective indication at our disposal in the entire sensory mechanism, since the motor element enters into all reflex responses. Therefore, the location in the brain of the various receptive centers determines the specific character of any given sensation. This conclusion is formulated by physiologists as the doctrine of specific sensations.

Since we may accept a definite localization of receptive cerebral centers for different sensations, we may go a further step and assert adjacent centers for sensory memories. Thus Collins has shown that in the zone of language there are three centers, each of which is the seat of memory of images of a sensory nature, and none of them of absolute autonymous activity. In these centers are stored, respectively, visual, auditory and kinaesthetic-articulatory memories, which are revived by stimuli coming from without, or spontaneously by the intelligence. What is true of visual, auditory and all kinaesthetic memories, articulatory and otherwise, appear to be true also of all specific sensation memories, although definite proof resolves itself into a process of subjective analysis, which in essence may be considered transcendental. While it appears certain that such centers as described do exist, and while there is excellent proof of the location in the brain of certain of them (sight and hearing), their circumscription is not entirely definite. Such an authority as Bastian does not believe in the complete topographic distinctness of the several sensory centers in the cerebral hemispheres.

We may, I think, accept the doctrine of specific sensations, and of the existence in the brain of specific sensory receptive centers, and of centers for the storing of sensory memories, although doubt exists as to their topographic distinctness. We may also assume that these memories may be revived by stimuli from without, or spontaneously by the intelligence. Upon these postulates we may proceed to an inquiry of the nature of paraesthesia.

The Nature of Paraesthesia.—After a study of the various kinds of abnormal sensations, as described by patients, it appears that they may be classified in their order of frequency as follows: 1. Disturbances of the sense of touch, which are related by the sufferers as feelings of numbness, deafness, formication, tickling, tingling, of pricking with pins, of something trickling along the skin, and similar comparisons. 2. Disturbances of temperature sense, related as feelings of heat and cold. Thus one of my patients with organic disease of the lower cord, complained for a year of coldness of the feet and legs, at certain times, and of a feeling of burning in the same locations at other times. To the hand of the examiner, and to the patient's own hand, the skin over these paraesthetic areas felt perfectly normal. In some cases (as in myelitis) patients say their legs feel as if they were packed in ice, so intense is the sensation of cold. 3. Disturbances of deep or interior sensibility, such as feelings of constriction around various parts of the body, especially the trunk, the legs and the head. Also there are often noted a great variety of abnormal sensations referred by the patient to the various viscera. Many of these are of evident psychogenous origin (as the sensation that a lizard is crawling in the stomach). In this connection, it is necessary to refer to the relation between hallucinations and paraesthesias. An hallucination is an erroneous sensory impression, without any external object actually existing to give rise to such impression; or stated in terms of our conception of the nature of sensation, it is a sensation arising in the absence of the natural efficient stimulus for the specific sensation in question. In fact, in true hallucinations, it is believed that the peripheral sensory mechanism is not concerned in their production at all. Hallucinations are probably always cortical in origin, while paraesthesias may or may not be. In hallucinations the exterior and interior senses are both affected; in paraesthesias we encounter only abnormal sensation affecting the interior senses, that is, the sensation is never projected without the body. In paraesthesias the patient institutes a comparison in describing his sensations. He compares a cutaneous sensation to that which would be produced by pins and needles. In hallucinations the patient becomes assertive and affirms the actual presence of pins and needles. The essential difference, then, is in the falsification of judgment and interpretation which occurs in hallucinations. In so far as the interior senses are concerned, we may be justified in saying that an hallucination is a paraesthesia which deceives the judgment. We may therefore conclude that paraesthesias are not the result of errors of judgment, for in that case we have pure hallucinations.

How, then, do paraesthesias arise? A study of certain diseased states in which paraesthesias more or less constantly occur will illuminate the problem.

In multiple neuritis, paraesthesias in the extremities are of exceedingly frequent occurrence in many types of the disease. The characteristic pathological disturbance is an irritative, and later a degenerative, process in the peripheral nerve trunks. We may then reasonably conclude that irritative lesions of the peripheral sensory neuron is capable of causing paraesthesia.

In tabes, we encounter an extraordinary variety of paraesthesias. Exclusive of the painful sensations in this disease we hear complaints of feelings of constriction in various locations (girdle sensations), a feeling as of the creeping of insects over the skin, a feeling as of cotton under the soles of the feet, a feeling of cobwebs on the skin, and of a feeling of fullness in various parts of the body. It is often stated that the ankles feel tight and swollen, but examination reveals nothing of the sort. The pathology of tabes must lead us to conclude that irritative lesions in the root ganglia and sensory pathways in the cord may cause paraesthesias of extraordinarily varied character.

In cortical tumors involving the convolutions situated behind the central fissure, sensory irritation phenomena are of frequent occurrence, resulting in circumscribed paraesthesias corresponding in area to the cortical representation. In some cases the paraesthesias appear paroxysmally, and spread in a fashion comparable to the Jacksonian type of motor manifestations, giving rise to abnormal sensations in the realm especially of touch and temperature. Such paraesthesias may easily give rise to hallucinations. As a focalizing symptom, such manifestations are of doubtful value, but they may be interpreted as indicating the fact that central lesions may cause paraesthesias. Their focalizing value is impaired by reason of the fact that the irritative lesion may occur not only in the cortex, but in the corona radiata, and frequently in the thalamus, and subthalamic region, as well as in lower portions of the sensory mechanism.

Aside from primary diseases of the nervous system, we find paraesthesias of all types occurring in such maladies as nephritis, diabetes, gout, and conditions of perverted metabolism. A reasonable explanation of their occurrence in these conditions is a toxic irritation of the peripheral sensory neuron somewhere along its course. Particularly in chronic interstitial nephritis, does one encounter sensory disturbances referable to touch (intense itching and dead fingers).

It is in the realm of so-called functional nervous diseases that we find the largest number of examples of paraesthesias. Particularly in hysteria are they encountered in astonishing varieties, in multiform localities, and in unusual distribution. They often constitute anatomical paradoxes, especially when considered in the light of other symptoms, and can be explained in no other way than that they are of psychogenous origin. A discussion of their mode of origin at this time would not only lead us too far afield, but would introduce us into a realm of fruitless and unprofitable speculation. We may take hysteria as the type of functional disturbance in which paraesthesias occur, and without embarking upon an argumentative discussion, conclude that in such states the emotions exert an exaggerated influence upon the sensory functions, possibly producing actual stimulation of the sensory area.

From the brief and incomplete consideration just given of conditions in which paraesthesias occur, we may reasonably conclude that they are found in both functional and organic diseases of the nervous system, as well as in certain general diseased states of the body, which do not constitute primary nervous disorders. We may also conclude that they may arise as the result of irritation exerted anywhere along the sensory mechanism from the peripheral end organ to the cortical termination. We may also with some justification infer that impulses reaching the sensory cortical area through association tracts from higher levels, may inaugurate paraesthesias. Finally we may conclude that a close relationship may exist between paresthesias and hallucinations, and that errors in judgment in interpreting abnormal sensations give rise to hallucinations rather than to paraesthesias. In other words, paraesthesias may give rise to certain types of hallucinations.

The Value of Paraesthesia as a Diagnostic Symptom.—Considered as an isolated phenomenon the occurrence of paraesthesia is of little value. The same observation, however, would apply to many symptoms of disease. A clinical picture is made up of many component parts, fitly joined together. In the minds of many patients paraesthesias occupy a very prominent position in the foreground, so that the examiner may be in danger of having his perspective clouded. The one conclusion which I venture to draw is that one should never interpret paraesthesias as resulting from functional disorders without exhaustive examinations. Very frequently these abnormal sensations represent early symptoms of severe organic disease in which early appropriate therapy is of the greatest importance. One should also remember that nervous manifestations do not necessarily indicate nervous diseases.

I have already sufficiently indicated the untrustworthiness of paraesthesias as focalizing symptoms in brain tumors. In such cases the presence of such symptoms is merely suggestive.

Finally allusion may with propriety be made to the occurrence of paraesthesias in cases who have suffered trauma in various parts of their anatomy, and are seeking adjustments in court. Frequently in such cases the paraesthesias occupy the entire field. Conclusions as to the nature and extent of the underlying causes are very hazardous, and opinions concerning such cases should be delivered with considerable reservation, since many a "hopeless" case has been quickly cured by a financial balm.

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SOME CLINICAL AND HISTORICAL NOTES ON EROTOMANIA.

By

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THE term erotomania is derived from the Greek words *ερως* and *μανία*. Dunglison defines the term very correctly in these words: "A species of mental alienation caused by love."

This is the definition I have adopted, since I shall view the subject from this standpoint rather than confuse it with that affection known as nymphomania, with which erotomania is often associated in the description of the disease in the text books.

Love, disassociated from lust, is a most important factor in its bearing on human conduct, and as an influence on mental operations, it is as potent as any other. This fact has left its impression on all who have correctly observed the phenomena in many cases. The purest love—the passion disassociated from lust—is a powerful one; it pervades all nature and life, and is responsible for actions at once noble, unselfish and towering in the loftiness of its tendencies.

On this subject, Maudsley says: "There is then a transport throughout the vegetable and animal kingdoms, which put forth all the beauty of their colors and all the harmony of their sounds; for the flowers are the dress of love, and the spring melodies of birds are love songs. The temperature of the plant is then increased, and it is arrayed in a floral glory such that Solomon in all his glory was not arrayed like one of these; the birds put on a gayer plumage and their exaltation bursts forth in raptures of varied melody; everywhere the functions reach a transport or ecstacy of love."

We have numerous instances of erotomania afforded by history. The earliest of these, that is completely outlined, is that of the erotomania produced in Antiochus by his love of his stepmother Stratonice.

Stratonice was a young, very beautiful woman, and the wife of Seleucus, the famous king of Syria—therefore the stepmother of Antiochus. The step-son visiting the royal palace often, became enamored of Stratonice. The passion grew until he became ill—poor appetite, insomnia, etc. His father was deeply attached to Antiochus and was greatly concerned as to the outcome of the malady which was rapidly hurrying him to death. In his efforts to restore his son, Seleucus consulted Erasistratus, who was the physician at his court. Erasistratus was famous as an anatomist, and devoted the years of his retirement to dissections. But, as a clinician and a student of mental disease, the diagnosis of the disease under which Antiochus labored was truly monumental. It was the work of a pioneer at a time when medicine was in its infancy, and will always challange the admiration of all who appreciate those who go alone in unexplored fields and discover the fine savannas which await those who will come after.

Erasistratus' name will ever remain one,

"* * * * * Around whose tomb,
Immortal laurels ever bloom."

I can do no better, I think, than quote from Rollin the account of Erotomania from which Antiochus suffered. I therefore reproduce his language: "Antiochus was seized with a lingering distemper, of which the physicians were incapable of discovering the causė; for which reason his condition was thought entirely desperate. It is easy to conceive the grief and anxiety of a father who beheld himself on the point of losing his son, in the flower of his age; whom he had intended for his successor in his vast dominions, and in whom all the happiness of his life consisted. Erasistratus, the most attentive and most skillful of all physicians, having carefully considered every symptom with which the indisposition of the young prince was attended, believed at last that he had discovered its true cause, and that it proceeded from love; in which conjecture he was not deceived. It was, however, more difficult to discover the object of this passion, which was the more violent from the secrecy in which it remained. The physician, therefore, to assure himself fully of what he surmised, passed whole days in the apartment of his patient and when he saw any lady enter, he carefully observed the countenance of the prince, and never discovered the least emotion in him, except when Stratonice came into the chamber either alone or with the king, her consort; at which times the young prince was, as Plutarch observes, always affected with the symptoms described by Sappho as so many indications of a violent passion; such, for instance, as a suppression of voice; burning blushes; dimness of sight; cold sweat; a sensible inequality and disorder of pulse; with a variety of the like symptoms. When the physician was afterwards alone with his patient, he managed his inquiries with so much dexterity, as at last drew the secret from him. Antiochus confessed his passion for Queen Stratonice, his step-mother, and declared that he had, in vain, employed all his efforts to vanquish it; he added that he had a thousand times had recourse to every consideration that could be represented to his thoughts in such a conjuncture; particularly the respect due from him to a father and sovereign, by whom he was tenderly beloved; the shame of indulging a passion altogether unjustifiable, and contrary to all the rules of decency and honour; the folly of harbouring a desire he ought never to be desirous of gratifying, but that his reason in its presnt state of distraction, entirely engrossed by one object, would hearken to nothing. And he concluded with declaring, that to punish himself, for desires involuntary in one sense, but criminal in every other, he had resolved to pine to death, by discontinuing all care of his health and abstaining from every kind of food.

"The physician gained a very considerable point, by penetrating into the source of his patient's disorder; but the application of the proper remedy was much more difficult to be accomplished; and how could a proposal of this nature be made to a parent and king?

"When next Seleucus inquired after his son's health, Erasistratus replied that his distemper was incurable, because it arose from a secret passion which could never be gratified, as the lady he loved was not to be obtained. The father, surprised and afflicted at this answer, desired to know why the lady was not to be obtained? 'Because she is my wife,' replied the physician, 'and I am not disposed to yield her up to the embraces of another.' 'And will you not part with her then,' replied the king, 'to preserve the life of a son I so tenderly love? Is this the friendship you profess for me?' 'Let me entreat you, my lord,' said Erasistratus, 'to imagine yourself for one moment in my place; would you resign your Stratonice to his arms? If you, therefore, who are a father would not consent to such a sacrifice for the welfare of a son so dear to you, how can you expect another should do it?' 'Would to God,' exclaimed Seleucus, 'that the cure of my son depended only on my asquiescence, I would resign both Stratonice and my empire to him, with all my soul.' 'Your majesty, then,' replied the physician, 'has the remedy in your own hands; for it is Stratonice whom he loves.' The father did not hesitate a moment after this declaration, and easily obtained the consent of his consort; and his son and that princess were crowned king and queen of Upper Asia. Julian the apostate relates in a fragment of his writings still extant that Antiochus would not espouse Stratonice till after the death of his father."

It would be supererogation, on my part, to quote other than the above. This is given because of its clinical and historical value in a consideration of the affection. Many instances could be drawn from history both ancient and modern, in which erotomania is clearly defined as a disease process. This affection is seen most generally but not exclusively in persons between the ages of eighteen and thirty, but this is by no mans the hard, exact rule. Very often old people have it. There are many cases illustrating this to be seen in practice.

In my practice, I have noticed at least three cases of erotomania which occurred in patients past their seventieth year.

The treatment of erotomania is, unhappily, not so easily conducted as it was in the foregoing case of Erasistratus. Very frequently we find the greatest difficulty in bringing about the mental *statu quo ante.* Some years since, I was called to treat a young woman, aged twenty, who was violently in love, and it affected her mind as it did Antiochus in the above mentioned case. In addition this patient was subject to fits of depression. She failed to respond to anything I could bring to bear on her disease, and succumbed after an illness of nearly a month. Dr. Benjamin Rush, in his book on "Diseases of the Mind," which is one of the pioneer treatises on nervous diseases, gives an account of a recovery from erotomania by resort to purgation. Depletion as resorted to in nearly all morbid processes in his day—by venesection and active purgation—would, as we can readily see, work results of a favorable character in some cases. The relief of cerebral hyperemia often follows blood-letting or purgation and it is probable that, in many cases, a cure followed this system of treatment. Still, modern thought revolts at both of these measures. They are unnecessary. I have treated these cases with generally good results by hydrotherapy. The patient is given a bath in moderately warm water, every twelve, six or four hours according to the degree of cerebral hyperemia present in the case. He is kept quiet by diverting the superabundance of the blood from the brain by baths, which allows restfulness, and tends to bring about the *statu quo ante* more readily than any means I have used. Drugs, other than such as we may use in emergencies, are not called for in erotomania.

Constipation is most unfriendly to the favorable progress of this disease. Cascara is most valuable here and should be given sufficiently often to keep the bowels loose.

When called first to see the patient, it may be necessary to give the bromide of potash, thirty grains every four or six hours—to quiet restlessness. Later, when the baths are regularly employed, no sedatives are called for.

It is highly important in the management of cases of erotomania to keep the patient from his old associates and even to sever communications from them.

Under hydrotherapy and proper environment most cases will yield, but occasionally we encounter those that are intractible, and go on to disaster.

EDITORIALS.

Conducted by

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TRAUMATIC PSYCHONEUROSES.

The "World War" has awakened renewed and more general interest in the subject of the functional nervous states as indicated by the increased number of contributions to the literature and which to a limited extent has been reflected in the pages of this magazine. That the medical profession stands in need of the knowledge that is being disseminated is evident from the crass ignorance or the brazen effrontery often displayed by members of the medical profession in our courts of law and reflected adversely upon the entire profession.

Many of the contributions on this subject, now found discussed under the title of "shell shock," are not only enlightening but evince careful observation and thoughtful study.

Most of the contributions confirm the views of the French school, that "Traumatic Neuroses," so-called, is not a new disease but is a syndrome of one of the neuroses or a combination of them all. Furthermore, it is generally recognized by those having the opportunity for extensive observations that the symptoms are rarely, if ever, the product of a single psychic trauma but result from a more or less mental stress, *i. e.*, they are psychogenic or idiogenic in one predisposed. In other words, they are the product of hysteria which is not now recognized as a pathological entity but a dyscrasia, inborn or inbred, the fundamental characteristics of which are suggestability, fatigability, exaggerated sensibility and emotionalism, from which it is easily understood how infinitesimal is the exciting cause of the ordinary symptoms. The "accident" is rather the "excuse" for pushing the button that releases the ever present electric current which makes itself apparent in the electric bulb. Pushing the button did not produce the electricity, nor did the accident directly push the button.

Battle Psychoneuroses.—Ballard, in the *Jour. of Mental Science*, July, 1917, states that there is nothing new in the symptoms comprising the syndromes—generically dubbed "shell shock"—arising from the circumstances of battle. But to those of us who have had large numbers of these cases passing through our hands, new ideas have been suggested, or the confirmation of old theories brought home.

First of all it may be said at once that loss of consciousness from physical or atmospheric concussion due to "blowing up" or burial is, in the vast majority of cases, merely the last straw in the production of the psychoneurosis.

A considerable number of cases break down without any such incident, or, if such occur, subsequently "carry on," to break down later without a second concussion. Concussion in civil life does not result in psychoneuroses in normal persons. It is not the blow on the head nor the loss of consciousness that is the root cause of "shell shock"; this accident simply "knocks out" the control—that is to say, the "censor" is thereby broken through.

The two main syndromes met with in shell shock are:

(1) Those of the anxiety neurosis type, manifesting tremors, sweats, palpitation, anxiety, somatic apprehension, insomnia, etc.

(2) Hysteria, comprising dissociations of consciousness, *e. g.*, delirium, stupor, automatism, amnesia; and somatic episodes, *e. g.*, deafness, dumbness, anesthesia, par-

alysis, etc. A third type of hysterical manifestation is fits. These may be clinically "hysterical," hystero-epileptic, or typically epileptic. The last frequently supervene after a latent period of apparent health in shell shocked soldiers who have sustained no head injury, who have no personal or family history of fits, and who show no signs of the epileptic temperament. Whatever the clinical character of the fits may be, they are hysterical in origin, even though they may become chronic as the result of cerebral habit after the need for suppression is long past.

In the vast majority of cases of shell shock, both the anxiety syndrome and hysterical symptoms manifest themselves during their course; and in a considerable proportion fits have occurred. But where a somatic hysterical episode (*e. g.*, dumbness) is successfully maintained, the anxiety *symptoms* (and often signs) are absent—that is to say, a man cannot be hysterically deaf and dumb, for example, and at the same time acutely anxious, agitated, and frightened when fully conscious.

The theory of the production of these episodes is briefly as follows:

As the result of continual suppression of the instinct and of continual stimuli tending to excite it (possibly also in part as the result of constitutional tendency in some cases), the instinct enters into a stage of chronic hyperexcitability, which in part constitutes the hysterical temperament. This involves, of course, an extra liability to hysterical episodes. The over-excited instinct results in physiological over-activity of the censor (over-suppression), and hence in the cutting off from consciousness not only of the fear complex, but other stimuli afferent to consciousness as well, *e. g.*, kinæsthetic sensations, ordinary sensations, etc. Thus are somatic episodes, such as paralysis, anesthesia, etc., produced. The fact that the soldier is fairly happy, *i. e.*, free from anxiety symptoms, when he has a somatic episode, is the result of the instinctive compromise constituted by the episode. The fear complex is still suppressed, but the instinct finds disguised expression as the episode achieves its ends, and there is then, of course, no conflict.

Very marked over-action of the censor cuts off afferent stimuli to consciousness from wide peripheral areas, and so produces the hysterical states of dissociated consciousness.

The actual site of the somatic episode is in some cases probably determined by associative memory, and often cannot be accounted for. In other cases its position is easily explained, *e. g.*, the exceeding commonness of deafness and dumbness is due to the over-suppression of the instinctive desires to listen and to cry out with fear.

Two physical signs sometimes seen in agitated cases are Romberg's sign, and "trombone movements" of the tongue on protrusion. The importance of bearing these signs in mind lies, of course, in their usual incidence in general paralysis of the insane and tabes. If purely functional (*i. e.*, shell shock), they are accompanied by incoordination of other types, tremors, and the physical signs of fear generally, and, moreover, by mental anxiety and keen power of auto-criticism.

D. S. B.

CLINIC FOR THE TREATMENT OF SYPHILIS.

In compliance with a resolution adopted recently by the Morris County Medical Society that, "if possible, at least three hospitals in the county establish a clinic for the treatment of syphilis or specific blood disorders," the Board of Managers of The New Jersey State Hospital at Morris Plains, at its recent annual meeting, authorized the establishment of such a clinic at this hospital. Through the liberality of high-grade drug concerns, the necessary drugs are to be provided without expense to the hospital or State. Prior to this, there has been no way by which those unable to pay could receive such necessary treatment; an innovation of a public, charitable character.

This is certainly a commendable innovation since it is doubtful if there is any greater menace to the future of the race than syphilis and many cases go untreated though not always because the patient cannot possibly pay for the treatment but because he will not, or because he believes treatment unnecessary after he is relieved of distressing or disabling symptoms, possibly suspecting the practitioner who correctly advises him, of selfish motives. However, it appears that this action may not be entirely devoid of evil, since it may encourage promiscuous sexual practices, though this may be somewhat counteracted by teaching the public the uncertainty of a radical cure and impressing the patient with the necessity of further medical observation.

D. S. B.

REPORT OF POLIOMYELITIS COMMITTEE.

The special committee appointed by the New York City Department of Health to study the epidemic of poliomyelitis which occurred in 1916, and suggest means for combating the disease, reports the result of the study of 2,496 cases diagnosed as poliomyelitis by the Department of Health out of a total of 9,023 cases in the city, it concludes that: (1) Infantile paralysis is communicated by personal contact. (2) Slight and non-paralytic cases are the most frequent sources of infection; as these cases arouse no suspicion, others come more in contact with them. (3) The disease usually develops from three to ten days after exposure. (4) Previous good health does not give immunity from attack. It was also found that the disease is slightly more prevalent among males than among females, and that the fewest number of cases occurred among nursing children and the greatest number among children who were receiving various forms of cow's milk. By far the greater part of this second group, however, were being fed on bottled pasteurized milk in which no germs of the disease could be present. Several cases of suspected milk infection disclosed upon investigation no evidence that the disease was so carried, and it is, therefore, concluded that the epidemic was not caused by contamination of the milk or other food supplies.

SELECTIONS.

CLINICAL NEUROLOGY.

WRITER'S CRAMP AND ALLIED AFFECTIONS: THEIR TREATMENT BY MASSAGE AND KINESITHERAPY.—Graham, *Edinburgh Med. Journ.*, October, 1917, writes that over-use of any group of muscles and nerves, especially in fine work requiring a high degree of delicate co-ordination of individual movements and voluntary impulses, as in writing, sewing, knitting, watchmaking, playing the piano, harp, or violin, etc., gives rise to similar disturbances as do also, but less frequently, excessive use of muscles in heavier occupations, such as painting, telegraphing, tailoring, shoemaking, blacksmithing, milking, etc., occasion like troubles of motion and sensation. Predominance of symptoms may be of a spastic, tremulous, or paralytic form, with extreme fatigue, pain, formication, hyperesthesia or anesthesia, and thrills like electricity. There may be total inability to perform the accustomed movements, or if they be attempted for a few minutes, the symptoms just named appear. The spasms may be of flexors or extensors—there may be rigidity or contraction of the muscles, local or general tremor. No two cases are exactly alike, as these symptoms are variously combined, and usually only called forth on attempting the work that has brought them on, while for all other purposes the hands and arms are well.

We see but few cases of writer's cramp nowadays, and hear very little about it. Sufferers from this consider it a foregone conclusion that nothing can be done for it and soon learn to use a typewriter or hire someone who can. Physicians, by their disbelief in the efficacy of any treatment whatsoever, have done much to foster this state of mind in their patients.

Writer's cramp usually occurs in those who are somewhat neurasthenic, and who write in great haste from the wrist, using the hand and fingers almost entirely for this purpose, and not combining the forearm and upper arm in the side-to-side movements, as they ought to do. The fingers, hand, and arm are generally perfect and powerful for every purpose, sometimes unusually so, and objective symptoms are said to be lacking. The writer has seen quite a few cases of writer's cramp, and in every one the space between the lower end of the bones of the forearm and the carpal bones has been unusually large—in other words, there has been too long a neck to the wrist. This favors the pernicious habit of moving the hand alone from side to side, thus obviating the healthful combination of fore- and upper-arm in these side-to-side movements.

Cure is largely a question of removing the fatigue, the over-excitation, the irritability which accompany it, as well as a re-education in proper ways of writing. This involves a careful consideration of many things—the method of holding the pen, of forming the letters, the height of the desk and the position of the patient thereat, the state of the eyesight, of the nerves and muscles, etc. With some patients a long period of rest would seem to be necessary before commencing treatment; others can be kept at their writing and improve if they be taught how to hold the pen easily and not to grasp it tightly, and be shown how to vary the methods of holding the same, if they have not already found out for themselves. Holding the pen between the fore- and middle-fingers is one of the best methods for relief. The penholder should be of as large a size as will afford à comfortable grasp, and may be of cork or surrounded by a rubber pneumatic appliance at the lower end. The pen should be neither too soft nor too hard, the point of medium size, and the paper neither too smooth nor too rough, in order that a proper resistance may be offered, so that the patient's attention may not be distracted thereby. The height of the desk should be on a level with the forearm when the upper arm hangs free by the side. It is often advantageous to change the angle of the paper from time to time, so that the patient may not get tired out from being too long in one position. Writing on a large book on the knees is sometimes easy, as it forms a good automatic tip-table instantly adjustable in any direction. The light should fall upon the paper in such a way as not to cast a shadow either from in front or on the right side.

Fine complex movements that are the last acquired are the soonest lost. Therefore, re-education leading back to these should be gradually begun by teaching the patient to make long parallel lines from left to right, and sometimes also from right to left. This is a good preparation of the upper arm for freehand writing. After this the patient should be taught to make whole lines continuously of large *l*'s, with wide interspaces, and also the reverse of these, with equally as large spaces—*m*'s and n's. These may be done either slowly or rapidly so as to break up the habit that the patient may have acquired. With improvement and facility in execution they should be gradually decreased in size. The advantage of this is that it trains upper arm and forearm to co-operate with the hand in those movements that are so necessary for easy writing. Later, a combination of letters and words must be devised to get the patient over any special *hitches* he may have. The word *legacy* offers a good combination for this purpose. After having made *l*'s for a while the patient can then practice *lelelele* until it becomes easy; then *legleglegleg* continuously, until this can be done with great ease, and so on to the end of the word.

When the patient has become somewhat proficient in writing an excellent exercise is to write the capital letters of the English alphabet connectedly as far as he can. He can usually go from A to I without a break. The writer, after having devised and employed this combination for years, found that Professor Zabludowski of the University of Berlin had independently and unknown to either of us been doing the same thing. Exercises of flexing and extending and separating the fingers, gradually increasing in vigor and duration, should be done three times daily, and for any one predisposed to writer's cramp these exercises form a good preventive measure.

Careful and skillful massage of the fingers, hand, and fore- and upper-arm, and also of the upper part of the back should be done daily for a while at first, and later every other day. It should not be that kind of massage that is so prevalent and consists mainly of allowing the hand and fingers to slip on the surface, but deep and searching and gentle, without chafing the skin or bruising the muscles. Alternating with the massage every few minutes should be given resisted movements of supination of the forearm, of extension of the hand and of each finger separately. Much tact, skill, and practice are required to adapt these resisted movements to the strength of the patient, and no novice had better undertake them. When done properly they are restful and invigorating in place of annoying and fatiguing.

These movements tend to restore a harmonious distribution of will, nerve and muscular effort by counteracting the motions that have produced the trouble.

ACUTE FEBRILE POLYNEURITIS.—Gordon Holmes, *Brit. Med. Journ.*, 1917, 2,950; 37, observes that most cases of multiple neuritis are due to organic or inorganic poisons or are complications of infectious disease. However, certain cases occur in which no definite etiology can be determined.

The onset of the illness is usually rapid, beginning with general malaise or fever without local manifestations. Pains in the legs and back usually set in on the second or third day, followed shortly by weakness in the legs. The paresis increases rapidly, the arms becoming similarly but less severely affected. The face may feel stiff or drawn, the speech become unnatural, and swallowing difficult. When the disease has become fully developed, the motor signs are the same as in ordinary peripheral neuritis except that the distal muscles are not much more severely affected than the proximal and the cranial nerves are involved. The facial muscles are usually quite severely paretic, articulation is slurred and indistinct, and mastication difficult. The tongue is rarely affected and there is no laryngeal involvement. Diplopia occurs quite often, due to ocular palsies.

Sensory symptoms are less prominent than the motor disturbances. Dull, aching pains are occasionally complained of, but these usually occur only when the legs or arms are moved. There is more or less tenderness of the muscles and nerve trunks. Objectively, epicritic and protopathic sensation are scarcely disturbed at all, while postural sense and the vibratory sense are markedly impaired. A certain amount of hyperaesthesia to light moving contacts is occasionally present. There is nearly always some disturbance of the sphincters, usually consisting of difficulty in starting or completing urination. The mental state of the patient is never affected. The urine shows no albumin or sugar.

Of the twelve cases studied by the author, one died of bronchitis and one of bronchopneumonia. All the symptoms reach their maximal severity in a week or so, and in those who survive the progress of the disease is characterized by rapid improvement.—*Cleveland Med. Journ.*

A CASE OF CLAUSTROPHOBIA.—W. H. B. Rivers (*Lancet*, August 18, 1917), records the case of a medical man thirty-one years old who was of a very nervous temperament and who suffered from some stammering and a very pronounced form of claustrophobia. The latter condition took the form of being afraid of closed spaces chiefly on account of the possibility of not being able to get out of them should anything happen. This phobia seemed to date from the time when he was six years old and was forced to sleep on the inside of a "box bed." Various attempts to cure the condition by psychanalysis, in which he was told that his trouble was connected with some sexual experience, failed to disclose the true cause of the condition and did not relieve him. Finally by means of a plan of psychanalysis, carried out by the author and the patient, in which he was told to remember and study his dreams and recall any events which they suggested, and which did not even mention the possibility of a sexual element, the cause was brought out and much relief resulted. The cause was found to have dated from the time the patient was three or four years old when he was accidentally locked in a dark hallway with a growling dog at its further end. This was followed by several severe illnesses which probably gave occasion for the relegation of the memory to his subconscious. The absolutely free association practiced in the analysis carried out mainly by the patient himself was what was required to recall the memory. It is emphasized by the author that much harm can be done and many failures recorded when psychanalysis is practised with the obsession that there must be some suppressed sexual element at the basis of the patient's trouble. The only scientific way to proceed is to encourage absolutely free association of ideas without suggestions as to the probable ultimate revelations which will emerge. The associations should be analyzed as they occur and the patient's thoughts then directed somewhat along the lines which seem the most promising.—*N. Y. Med. Jour.*

THE AUTOSERUM TREATMENT OF CHOREA.—Tarr, *Northwest Medicine*, October, 1917, discusses various theories as to the etiology of chorea, rheumatism being first considered; one author quoted states that 52 per cent. of cases in hospital and private practice gave a history of rheumatic manifestations or showed evidence of rheumatism—these associations being borne out by the results of treatment.

Hundreds of cultures from the blood, teeth and tonsils of patients suffering from chorea have been studied in the past few years, but nothing satisfactory has been proved. A few streptococcus cultures have been reported from the teeth and tonsils, but blood cultures have been for the most part negative. No valuable conclusions, therefore, have been offered.

The wide diversity of opinion as to the pathology is an evidence of our lack of definite knowledge.

The followers of Hirt were convinced that there is a toxemia affecting the centers in the cortex and their research inaugurated the basis upon which the present scientific treatment is founded. Paine has found the diplococcus of rheumatism in films made from the pia mater in fatal cases of chorea and these cocci were all seen in the vicinity of a blood vessel. This proves nothing, but suggests that the treatment should be directed to the central nervous system.

Wassermann, in 1889, described a streptococcus which he believed to be the cause of chorea. When injected into guinea pigs it caused a rise in temperature, swollen joints and choreiform movements. Goodman investigated the etiology of chorea and noted at autopsy involvement of the central nervous system. This suggested to him that the disease was infectious and that treatment failed because it had not reached the seat of the trouble, hence he began the use of serum with the following technique:

(1) Exclude tuberculosis and syphilis.

(2) Rest in bed for several days without treatment, in order that all drugs may be eliminated from the system.

(3) Forty to 50 c.c. of blood is drawn from a vein and centrifuged. This amount of blood will furnish about 15 to 20 c.c. of serum. Keep on ice until ready for use.

(4) Lumbar puncture is done and 15 to 20 c.c. of fluid is removed.

(5) The serum is warmed to body temperature and from 10 to 18 c.c. are slowly injected into the spinal canal. This should be done slowly, ten to fifteen minutes being the average time consumed.

(6) Patient to remain flat on back for an hour or two.

While the technic is simple and requires very little in the way of special apparatus. Obtaining the blood is usually the easiest part of the procedure. A vein in the arm is usually chosen. Some will be entered with no difficulty while others will give some trouble. I favor a needle two inches long and about the caliber of a lumbar puncture needle. To the end of this is attached a short piece of rubber tubing which is carried into the special collecting tube. Others find the syringe very satisfactory. An objection to be considered is the fact that a 40 c.c. glass syringe is expensive and easily broken. The needles are supposed to fit, but often air is drawn in and this hastens coagulation. However, it is a matter of personal preference and both are probably equally good.

A 50 c.c. centrifuge tube is used. After the blood has been transferred to the tube a sterile cork is inserted and the blood is centrifuged. The serum is now drawn into a sterile tube, corked and placed on ice until ready for use. Inactivation has been found unnecessary.

Lumbar puncture is done in the usual manner. This requires two assistants, one to hold the patient and one to pass the tubes, syringe, etc., to the operator. When the needle has been passed into the spinal canal, the fluid is collected into sterile tubes and saved for the laboratory. Cell count and globulin is recorded. The next step is the introduction of the serum.

The most satisfactory outfit for this consists of a 30 c.c. Luer syringe, a rubber connecting tube and a metal tip that will fit into the end of the regulation Quinke needle. By using a piece of tubing enough play is gained, so that the movements of the patient do not interfere in the least with the slow and careful introduction of the serum. Everything has been done in a clean and careful manner and the possibilities of having done the patient any harm are very remote indeed.

The author reports the following summary:

Eleven of the fourteen cases were cured, two were improved and one showed no improvement. The number of injections given was 23. The greatest number given to a single patient was three. The amount of serum per dose ranged from 7 c.c. to 18 c.c. No rule can at present be set as to the exact amount of serum necessary to produce the desired effect. The youngest child in the series received 16 c.c. and the eldest (16 years) received the same dose. The former was well in forty-eight hours, while the latter was improved in four days and well in about two and a half months.

The author makes the following suggestions as to the care after the serum has been injected:

(1) Place the patient in a quiet room, by himself if possible.

(2) Give no solid food for the first 12 to 24 hours. This will help to avoid the nausea and mild vomiting that usually is noted.

(3) Exclude visitors for at least 48 hours and leave the patient alone as much as possible.

CONCLUSIONS.

After studying the records of this small series of cases the following conclusions seem warranted:

(1) The treatment is simple and when properly done is no more dangerous than the ordinary lumbar puncture.

(2) It requires no elaborate outfit and can be done behind a screen on the ward as well as in the operating room. When properly equipped there is no reason why it should not be done by the physician in the average home.

(3) Anesthesia was required for none of the above cases, but I see no reason why it might not be used in severe cases when necessary.

(4) Acute cases can be cured before cardiac conditions develop. This is, in the writer's opinion, the strongest argument in favor of the treatment.

(5) Anything that will have a favorable influence on the course of an active chorea without doing any harm to the patient is worth consideration.

So-Called Habit Spasm (Tic) and St. Vitus' Dance.—Burr, *Penn. Med. Journ.*, December, 1917, writes that habit spasm and St. Vitus' dance superficially resemble each other, but differ in causation and in their real symptomatology and require unlike treatment.

Habit spasm (tic) is an evidence of biologic, protoplastic weakness, the result of heredity; St. Vitus' dance occurs in children congenitally normal.

Chorea is not due to specific micro-organism, but caused by some one of several poisons introduced from without and does not require congenitally, pathological soil for its fruition, and not caused by nervous shock from fright. Clinically there is a close relation between rheumatism and chorea, and vegetative endocarditis is often found at autopsy. Cardiac murmur almost always occurs, though in a series of thirty consecutive cases, hemoglobin averaged 80 per cent. and erythrocytes over four million. Eosinophilia frequent, more marked in third and fourth attacks. Intestinal parasites not found. Acute infectious fevers, especially scarlatina, occur as immediate precedents of chorea. Predisposing causes not known, heredity, direct or indirect, and environment play no part; and racial immunity in the negro.

Tic occurs only in nervous children, with signs of degeneracy in family, frequent among imbeciles. Exciting causes: errors of refraction, troubles of nose, bad teeth and worms are most frequent; and refractive errors most important.

Tic most frequently confined to face and shoulders, more rarely to hip and legs;

though chorea may begin in muscles of head and shoulders, usually soon becomes general, or involves one side.

Tic movements are purposive; chorea are wildly incoordinate—"insanity of the muscles." Reflex spasms must be differentiated. The choreic child not emotionally normal—his character, temperament and disposition change temporarily for the worse, is always fretful, peevish and disobedient; usually sleeps well, during which movements cease temporarily and dreams but little; occasionally becomes insane.

The child with tic, usually emotionally quiet on the surface, though fundamentally sensitive and often precocious.

The choreic child should be put to bed for weeks; have no visitors, no play and kept quiet. Diet should consist largely of milk, with fresh green vegetables; no meat and not overfed. Fowler's solution with anti-rheumatics, though the author finds those not given anti-rheumatics do quite as well.

In tic remove any discoverable source of peripheral irritation; systematic but not strenuous gymnastic exercise; during adolescence, the sexual habits and feelings should be investigated and proper advice given.

Tic indicates supersensitiveness, hence possibility of the development of psychoneuroses or psychoses at puberty or during adolescence; hence prophylactic training and care necessary.

ETIOLOGY AND SPECIFIC TREATMENT OF HAY FEVER.—A. Parker Hitchens, *Penn. Med. Journ.*, December, 1917, emphasizes the importance of a diagnosis obtained by (1) a thorough rhinoscopic examination to exclude any abnormality; (2) a specific diagnosis on the season of the year, spring and summer producing the pollens of common grasses, fall producing the pollen of ragweed (the author suggested a button, containing a coverglass coated with a glycerine mixture, by which means the particular pollen inhaled might be identified); (3) skin tests made similar to vaccinia, using a tablet triturate of pollen, at the end of an hour and again in twenty-four hours, the reaction being noted as is also the pollen used. Negative tests may show an immediate area of redness but which does not increase. For prophylaxis an initial dose of extract containing 0.0025 mg. nitrogen may be given two or three months before the season; subsequent injections with five to seven-day intervals. Prophylactic injections are not successful in every case. For treatment in season, individual consideration is necessary, as the period of relief varies. A few persons are relieved for twenty-four hours only, and in these cases daily doses are necessary. The normal period of relief is five days.

Many causes have been mentioned, *e. g.*, external irritant dust, plant emanations, various odors, atmospheric conditions, solar heat, constitutional defects of hay fever patients, nervous diathesis. Dr. Hitchens enumerated the uric acid theory of 1868; the bacterial theory of 1869; the pollen theory of Blackley followed by the nasal theory (nasal disease); three-factor theory, a combination of the existing opinions, requiring three elements, viz., constitutional defect, pathological condition, and external irritant. The last mentioned theory has persisted to the present day.

The work of Dunbar in 1903 was reviewed, his experimental work, corroborating the work of Blackley; his work on the chemistry of the pollen determining the exciting cause or special substance causing the symptoms of hay fever. The special substance found was an albuminous body or toxalbumin. This latter substance Dunbar was able to demonstrate as being thermostable, acid stable; enzymes such as pepsin and trypsin are unable to destroy it; lastly, it is precipitated by complete saturation with ammonium sulphate. The toxin-antitoxin theory of Dunbar was soon attacked from the anaphylaxis standpoint and it is now agreed that the symptoms of hay fever are merely a manifestation of hypersusceptibility of the tissues to the albumin of certain pollens. Treatment by pollen vaccine has given further evidence in favor of the anaphylactic nature of hay fever. Dr. Hitchens went into detail in the preparation of the vaccine. He claims that 88 per cent. of patients treated have reported entirely free from symptoms or are markedly benefited.

The author gives the following conclusions: (1) Hay fever is due to a protein constituent of the pollen of plants. (2) The hay fever attack is a manifestation of hypersusceptibility to this protein and the disease is to be classed among the anaphylactic phenomena. (3) By means of very simple skin tests the exact varieties of pollen to which an individual is hypersusceptible may be determined. (4) It is a well known fact that hypersusceptible animals may be desensitized by the use of minute doses of the protein to which they are susceptible. (5) In like manner hay fever patients may be desensitized to the pollens to which they are hypersusceptible by the subcutaneous injection of extracts from these pollens. (6) By the repeated injection of proper pollen extracts before the season a certain percentage of patients may be immunized to hay fever. (7) At least 80 per cent. of the patients receiving vaccines may expect considerable relief or entire freedom from symptoms throughout their season.

INEBRIETY FROM A MEDICAL VIEWPOINT.—Neff, *Boston Med. & Surg. Journ.*, February 8, 1917, formulates the following deductions as medical truisms:

(a) Inebriety is an expression of nervous weakness or instability. Used in its simplest sense, it could be called a psycho-neurosis. Many cases show symptoms which are found in neurasthenic states and allied conditions. Drunkenness is a symptom of an unstable nervous system, and a contrary view is not justified by clinical observation or experience.

(b) The exciting causes of inebriety are of a physical and psychical origin; given a predisposed subject, the crisis of inebriety may be precipitated by any marked departure from ordinary routine (psychical), or by any disturbance of a physical nature (physical).

(c) Inebriety is prone to develop at the critical epochs of life, namely, pubescence, adolescence and involution. Developing during involution, it is generally the effort of an individual to maintain his productive powers by recourse to artificial stimulation. The declaration of inebriety at these periods suggests an analogy to the psychoneuroses.

(d) Inebriety, being an expression of neuropathy or psychopathy, may be preceded by or accompanied by a multiform nervous syndrome. Thus each case is essentially different.

(e) A comparatively small percentage of the users of alcohol are confirmed drunkards or inebriates.

(f) The appropriate care of inebriety implies both curative treatment and custodial care; curative treatment being directed to the case which is likely to be benefited, the custodial care, for economic reasons, should be directed to the recidivists. For the purpose of individualization in treatment, such a differentiation must eventually be made, and an appropriate segregation of these two types established.

WAR SHOCK; THE PSYCHONEUROSES IN WAR; PSYCHOLOGY AND TREATMENT.—Eder, *Lond.*, *Heinemann*, 1917, in this work, based upon a study of a hundred consecutive cases (psychoses excluded) which came under the author's observation while he was in charge of the psychoneurological department at Malta, concludes that:—

(1) War shock is hysteria occurring in a person free from hereditary or personal psychoneurotic antecedents, but with a mind more responsive to psychical stimulus than the normal.

(2) The wrenching from the customary calling and life, the new discipline,

the peculiar and terrible mental strain of modern war conditions acting upon this sensitive mind determine the disease among soldiers.

(3) In 100 consecutive cases of psychoneurosis 70 per cent. correspond to this description; 30 per cent. have neuropathic antecedents, hereditary or personal; the latter correspond more closely with the psychoneuroses seen in civil life.

(4) Shell-shock, gas-poisoning, or other physical injuries do not cause the disease. The symptoms are protean—palsies, analgesia, amblyopia, mutism, deafness, affections of the vegetative system such as the soldier's heart, vomiting, diarrhea, insomnia, loss of memory, somnambulism, phobias and obsessions of all kinds.

(5) These symptoms are the result of mental conflicts or other mental phenomena; all the symptoms can be understood in terms of the mind without any reference to physiopathology.

(6) The psychopathology of war shock is that of the psychoneuroses, and the mechanisms those discovered by Freud in hysteria.

(7) War shock is not a new disease; it is a variety of hysteria where the one factor (the psychic trauma) is overwhelmingly large in relation to the second factor (predisposition); it is separated from non war shock cases in degree, not in essence.

(8) The treatment par excellence is hypnotic suggestion, the suggestion by preference being directed to the complex as determined from the psychological examination and general psychoanalytic conclusions.

(9) 91.5 per cent. of cases of war shock were cured by this method and 8.5 per cent. improved. Of soldiers with previous neuropathic antecedents, who were cured, 27.6 per cent. improve and 10.4 per cent. are unaffected. Cure is very rapidly effected; most cases are well in less than two weeks, some in a few minutes or hours.

(10) The usual objections to hypnotic suggestion do not apply to war shock by reason of the absence of neuropathic antecedents.

(11) All methods of treatment, other than psychoanalysis, are based on suggestion, including "spontaneous recovery," persuasion, reasoning, symptomatic treatment, electrotherapy, etc. The objection to these indirect forms of suggestion is that they are less effective (more uncertain and less rapid) than suggestion under hypnosis.

(12) The earlier the patients are treated by this method the better.

(13) The majority of war shock patients so cured can return to the front in three to six months.

(14) Cases of "functional" disease should not be discharged from the army until cured.

THE DRUG TREATMENT OF MORPHINISM.—Carlisle, *Boston Med. & Surg. Journ.*, February 8, 1917, outlines the following routine treatment of morphinism:—

A mixture containing scopolamin hydrobromide gr. 1-150 and morphine hydrobromide gr. 1-6, is given hyperdermically on the evening of the day of arrival, and repeated at intervals of six hours during the first twenty-four. The early effects of scopolamin usually make their appearance during this period and are manifested by marked dryness of the throat, with difficulty in swallowing, dilated pupils with blurred vision, and speech becomes difficult and rather jerky. The patient may now, or perhaps not until the following day, become mildly hallucinated (visual and auditory). In conversation his sentences are apt to be short, sharp and often incomplete, due no doubt to flight of ideas and hallucinatory control.

On the second day the intervals for injection are increased to eight, and on the third day, to twelve hours. In typical cases the depressant effect of the drug (scopolamin) presents itself at about this time, continuing as a rule to some degree through the third and fourth days. This stage is characterized by a sensation of great fatigue and drowsiness; the excitement is greatly reduced and the patient seeks his bed and should obtain sleep of from four to eight hours' duration.

On the fourth day there may be some nervousness and gastric disturbance, but usually no craving for morphia. At bedtime the final dose of the scopolamin-morphine mixture is given, together with fifteen grains of trional. This is almost invariably followed by a comfortable night's sleep, lasting from six to eight hours.

Active purgation is obtained during the withdrawal period, through the liberal use of compound cathartic pills, cascara sagrada and salines. It is of vital importance that the bowels should be made to act thoroughly each day in order to rid the system of morphine and its by-products, but the drastic catharsis recommended by some authorities does not in our experience appear necessary.

Individuals who fail to respond to the usual physiological effects of scopolamin, are given a modified treatment, increasing or decreasing the rapidity with which the injections are made. It often occurs that through an apparent immunity on the part of the individual, the intervals must be reduced to two or three hours until full response to it is obtained, then lengthening the interval as the case may require. About two per cent. of cases show an idiosyncrasy to scopolamin, which makes it necessary to discontinue its use and resort to treatment by gradual reduction. These show little more than exaggerated throat symptoms and dilation of the pupils, are exceedingly uncomfortable and are never able to progress as far in their treatment as the depressed phase.

In the majority of instances, the morphine is removed from the addict's system with reasonable comfort, in a period of about four days, leaving him in fair general condition. At this time convalescence begins.

There is no specific treatment for morphinism, and no treatment, whatever the procedure adopted, can be successful in its results, unless it is followed by a prolonged period of convalescence. Many forms of treatment fail through the neglect of this important detail.

Immediately after withdrawal of morphine, and for a period of several weeks, the individual is nervous, troubled with insomnia, and in a condition wherein he is torn between conflicting emotions; he is impulsive, lacks self-control, and if not restrained, may suddenly disappear. For these reasons a ward residence of from one to two weeks is necessary.

Improvement in general bodily health is from now on surprisingly rapid and in a few weeks, under tonic treatment, regulated daily routine, proper diet and out-of-door exercise, the insomnia, which is often troublesome during early convalescence, rapidly improves, and the patient appears and acts more like a normal individual. He is now given the opportunity and assistance to build up his resistive powers, strengthen his will and self-control, and readjust his mental attitude toward the use of drugs. A spirit of co-operation should exist between himself and his adviser, who should have his entire confidence.

Following a residence of from six to twelve weeks the individual may now leave the hospital with some assurance of success.

CLINICAL PSYCHIATRY.

CERTAIN OF THE CLINICAL ASPECTS OF LATE KATATONIA, WITH A REPORT OF CASES.—Stricker, *American Jour. of Insanity*, October, 1917, presents an elaborate study of this subject in which he analyzes a series of twenty-five cases presenting a strong admixture of katatonia-like phenomena occurring in the fifth, sixth and seventh decades with the object of ascertaining whether "late katatonia" is a separate or distinct psychosis or whether it is possibly but an exacerbation or recurrence of an earlier condition which had been quiescent.

The investigation is based upon the interpretation of "katatonia"—whether it be a clinical entity or whether it is a symptom or syndrome which may appear in various diseases of the brain and especially in the pre-senile and involutional psychoses.

That a katatonic symptom-complex may occur in the greatest variety of conditions has long been recognized. It has been described by numerous observers in toxic and exhaustive states, typhoid and other acute infections, as a post-operative sequel, in renal insufficiency, organic brain disease, abscess and tumor, cerebellar hemiatrophy, head injuries, general paralysis, epilepsy, hysteria, manic-depressive, and other so-called functional psychoses. Probably its rather striking characteristics, when it does appear, have led to frequent attempts to gather all its manifestations together under one heading and to elevate them to the dignity of a distinct disease-enity. It must be remembered too, that Kahlbaum advanced this view in his original description. Later Spitzka, Hecker, Meynert, Hammond, Neuendorff, Neisser, Fink and Brosius all wrote of it as a separate form of insanity and more recently Urstein assigns to it a broadly inclusive and very important rôle. The very fact that it is so widely distributed should create some doubt as to its significance as a primary process. Again it may be very mild and transient in one case and dominant in another; a clear-cut, early appearing and long-enduring symptom in one condition and a doubtful and late one in another, and in one patient have a mechanism more or less naturally explainable on the basis of the remainder of the psychotic content, and yet be totally inexplicable in another. To believe that stupor, catalepsy, stereotopy, mannerisms, mutism, and indeed the whole list of katatonic symptoms, must always be produced by the same combination of circumstances and have a similar meaning, would seem as unreasonable as to assert, for instance, that convulsions, coma, cough, or anorexia from the province of internal medicine are always called out by the same basic factors and always have a uniform pathology. Even in dementia praecox considered as a whole, although each of its forms, including the paranoid is apt to show some katatonic admixture, there is scarcely sufficient clinical evidence to warrant us in revising the usual opinion that dementia praecox is the disease and katatonia the symptom. At most katatonia may be granted a distinctive but still subsidiary rôle and be regarded as bearing a somewhat similar relation to the parent condition, as do the subdivisions of typhoid fever or pneumonia to the original diseases to which they are but the clinical and anatomical derivatives. Especially in the late psychoses is it important to keep in mind the symptomatic value of the katatonic signs and not to bring them into the foreground at the expense of other portions of the picture. In the first place, we are dealing with a period in which katatonia is exceedingly rare, and further if we study the entire life histories of the conditions in which it arises and separate out the symptom groups presented, we are likely to find that the "katatonia" will be somewhat dwarfed by other considerations, such as the effective reaction, the state of the consciousness, perhaps as a measure of toxicity, the delusional content and the general effect of destructive organic brain changes.

The author thus summarizes:

1. The clinical evidence of true katatonia in the late psychoses is neither prominent or distinctive enough to justify the assumption of a late katatonic disease process and during the climacteric-pre-senile period it is rarely more than a symptom-complex of doubtful diagnostic value.

2. In mental disease occurring during and after the fifth decade, with the possible exception of outspoken dementia praecox, the katatonic manifestations are essentially unlike those of early katatonia and the generally superficial resemblance is often explainable on the basis of certain incidental factors.

3. Among the factors which may be operative in giving a katatonic coloring

to the insanities of the climacteric-pre-senile epoch, and which are in some sense peculiar to this period, may be mentioned the relative inelasticity of affect-life, with a tendency to the development of a monotonous depressive phase, the inclination to marked irritability, which may be a pathologic increase of the rather common and almost physiological reaction of the menopause, the confusion and disordered condition of the consciousness, which is probably connected with toxicity due to epochal metabolic disturbances, the influence of somatic nihilistic delusions, possibly related to similar physical alterations and finally the effect of regressive circulatory changes which may complicate and alter the expression of the late so-called functional psychoses.

4. "Late katatonia" which is true to type may possibly appear in late dementia praecox, but usually even here it cannot be clearly established clinically, and further katatonic dementia praecox, with an onset after the fourth decade, is extremely rare and practically always open to the suspicion of being a relapse from an earlier psychosis, which had become quiescent.

NEURO-ETIOLOGY.

FUNCTIONAL CONDITIONS IN THE LIGHT OF HEAD INJURIES.—T. E. Harwood, *J. Roy. Army Med. Corps*, 1917, XXVIII; 699, writes that the main theories as to the causative factors in functional nervous conditions are: (1) That they are pure neuroses; (2) that they are the effects of toxins, endogenous or exogenous; (3) that they are caused by abnormalities of internal secretion; (4) that they are due to psychic causes.

In fatal head injury, without obviously adequate cause of death, the result is put down to shock. The cause of shock, according to Crile, is due to any exhausting peripheral or central stimulus, psychic influences, cerebral anemia, and poisons and toxins. The prolonged functional effects of head injuries may be regarded as a chronic phase of shock, which produces neurasthenic effects upon the body as a whole.

The author compares the neurasthenic state to an electric system in which there is some fault in circuit or battery. To correct the fault in the nervous system of the body is the therapy necessary to cure the neurosis. The most common fault is due to refractive errors, often of minor degree. Correction by glasses in many cases leads to the disappearance of symptoms. In several cases of head injuries in patients who previously were well, the author found that accurate correction of refractive errors resulted in improvement or relief of the neurotic symptoms. Apparently the head injury leads to a lowering of the efficiency of the whole nervous system, so that the slight nervous irritation of a refractive error is sufficient to prolong the nervous instability.—*Cleveland Medical Journ.*

THE ETIOLOGY OF ARTERIOSCLEROSIS.—Warfield, *Journ. of Laboratory and Clinical Medicine*, November, 1917, writes that although a vast amount of work has been done in the attempt to produce arterial changes in animals which are comparable to those found in man in the group disease known as arteriosclerosis, the subject is still unsettled. As a matter of fact there is really no actual disease which we call arteriosclerosis. It is rather the end result in the arterial system of the action of several poisons elaborated in the body under a variety of conditions. So far as we now know these poisons may be roughly divided into two classes, (1) those produced by infectious diseases, and (2) those produced by hypothetical, but probable, poison elaborated in the digestive tract as the result of the insufficient or aberrant digestion of the proteins. A third factor has undoubtedly a bearing on the production of arteriosclerosis in any individual. This is an indeterminate factor, it cannot be controlled in the individual, for it is a part of the person's very birthright (or birthwrong), namely, heredity.

Still one other and definite factor is to be considered. This is syphilis. Studies of recent years leave no doubt that there is a specific form of arteritis caused by the spirochete pallida which may eventuate in a generalized arteriosclerosis.

An examination of the literature of the past few years reveals the fact that some investigators have produced arterial changes in small animals by the injection of various poisonous substances and blood pressure affecting substances, while others who have used these same substances have failed to confirm the results.

In 1908 D'Amato reported some feeding experiments on dogs. He fed them for months on putrefied meat and succeeded in producing inflammation and degeneration of the media and adventia with calcification and hyperplasia of the intima. In the pulmonary artery, the carotids, in the venae cavae, and in the myocardium there were extensive necroses and hyaline degeneration. He also tried injections of sodium urate and ergot. These drugs caused necrosis in the muscularis and elastica of the aorta, pulmonary artery, vena cava inferior and heart muscle, but there was no subsequent calcification. His work showed that under quite grossly abnormal conditions of feeding, it was possible to produce arterial changes. One could scarcely affirm that he was able to produce arteriosclerosis analogous to that in humans.

Among others who have fed the etheral esters of bactrial putrefaction to animals is Dratschinski, who fed indol for long periods in small doses to guinea pigs and monkeys. This apparently induced an atheromatous degeneration of the aorta and primary stage of sclerosis of the aorta and the vessels of the brain in the pigs. In monkeys sclerosis of the adrenals was produced.

Since Thayer and Brush showed that the arteries of those who had had typhoid fever were more easily palpable than those persons of corresponding age who had never had typhoid fever, attention has been directed to the relationship of infectious diseases and subsequent chronic arterial degenerative changes.

Frothingham, for example, studied at autopsy the vessels of persons up to 40 years, who had died of infectious disease. It is interesting that he found demonstrable arterial lesions in those dying of infections or disease complicated with the pus-forming cocci. He also studied the arteries of rabbits suffering from experimental nephritis the arteries of a cat which had been glycosuric for over a year, and of rabbits injected with adrenaline and spartein. All these last revealed no arterial lesions. He concluded that although the study has thrown no light on the relation between non-infectious toxins and arterial disease, it has shown that during acute infectious diseases severe localized arterial lesions may occur.

Later he critically analyzed all claims made by those who said they had produced arteriosclerosis by the injection of various toxic substances or blood-pressure raising substances in animals. He concluded that none has sufficient grounds for maintaining the successful production of arterial changes analogous to those which occur in man. Alcohol has been said by some to produce arteriosclerosis, by others it is said to have no effect.

It seemed that Longcope's work on the lesions produced by chronic protein intoxication should throw some light on the question, but he says that he was unable to find in his animals evidences of arteriosclerotic changes.

Further search through recent literature has not been rewarded by any more definite information.

The chronicity of the condition and the fact that it is the result of several diverse causes led to a clinical research among a group of inmates in the Milwaukee County Almshouse and Hospital. These results are briefly described.

The material consisted of 500 persons ranging in age from 38 to 90 years. There were 412 men and 88 women. So far as possible a careful history was obtained with particular attention to the history and severity of various infectious diseases and pyogenic infections. The radial arteries were examined and note was made of the degree of palpability. At the same time the systolic and diastolic blood pressure were taken. As there was no relationship shown between blood pressure and palpable arteries of various grades, this feature has been omitted in study. Age had no influence so far as our studies were concerned. Old men of 80 had soft arteries while men of 40 had hard, palpable arteries, and no relationship could be shown between the infectious diseases and arteriosclerosis at different ages.

The following diseases are listed in this study: Measles, infectious arthritis, pneumonia, typhoid fever, scarlet fever, and smallpox.

These cases were grouped according to history of single disease and those with two or more diseases in childhood or early adult life.

Measles heads the list with 47 cases, 28 of which were classed as positive. No palpable sclerosis was found in 19. Smallpox was the only disease in 14 cases. Of these one was positive, 9 were negative.

When we come to examine all those with more or less severe single infectious diseases, we find 100 cases of sclerosis, 82 occurring in the severe infection group and 18 occurring in the mild group. There were 78 cases of definite sclerotic radials who had never had any infections.

There were 147 cases who had had one or more infections, but in whom there was no sclerosis made out. In 105 cases there was no history of infection and no evident sclerosis.

Of the 150 persons with multiple diseases, there were 80 whose radials were definitely found to be sclerotic. Seventy-two of these 80 had infectious diseases of severe nature, 8 had only mild attacks. Seventy showed no sclerosis. Forty-four of these had severe infections, 26 had mild infections.

Briefly these figures can be resolved into this table:

252 cases without sclerosis.
248 cases with sclerosis.
147 cases with infections but no sclerosis.
180 cases with infections and sclerosis.

The author concludes that the infectious diseases play little or no part in the production of arteriosclerosis.

ON THE NATURE OF NEUROPATHIC AFFECTIONS OF THE JOINTS.—Leo. Eloesser, *Am. Surg.*, 1917; LXVI; 201, states that the questions involved in a determination of the cause of neuropathic affections of the joints are:

1. Are tabetic arthropathies due purely to degeneration of certain nerves that cause the bone to atrophy? (Charcot's theory.)

2. Are they simple syphilitic arthritides, occurring sometimes in the course of a tabes, but not infrequently found in the absence of any nerve lesion? (Barre and Babinski.)

3. Are they due to the combined influence of nerve and bone lesions? If so, where does the primary change lie? In the nerve or in the bone? What is the nature of the nerve change? Is it merely a lack of sensibility, or is it the degeneration of some nerve assumed to exert a trophic influence? What is the nature of the bone lesion? Is it an arteriosclerotic deforming arthritis, or a syphilitic one, or one the result of an unfelt trauma?

In order to answer these questions the author aimed to produce lesions in cats simulating as nearly as might be tabes in man. A series of posterior roots leading to a particular extremity, enough of them to make a total analgesia, anesthesia and ataxy, were cut. This eliminated many of the factors complicating tabes; the underlying syphilis, for instance. Sections of cords from these cats show an ascending degeneration of the posterior columns corresponding to what would be in a man a one-sided tabes. Cutting one side only enabled the author to have the other as a control. He watched the cats for a considerable period and had the satisfaction of seeing some of them under certain conditions develop what in man would be called a Charcot joint or a tabic fracture.

From these experimental lesions on cats the author states the following conclusions:

1. Bone and joint lesions corresponding to those found in tabes dorsalis may be induced experimentally in the limbs of cats by severing the posterior nerve roots (the sensory fibres) leading from the limb.
2. Severing the posterior roots causes no atrophy of the bone.
3. Tabic fractures and arthropathies have been produced in healthy animals, hence they cannot be ascribed primarily to lues or other infectious causes.
4. The course of deforming arthritis is not characteristically altered by the addition of an analgesic factor, hence the cause of Charcot joint is not to be sought in a simple deforming arthritis occurring in a tabetic.
5. Nothing in these experiments gives proof of the existence of trophic nerves.
6. Of three animals whose joints were subjected to operative trauma after having been previously rendered anesthetic by resection of posterior roots, all rapidly developed Charcot lesions. Trauma in a limb rendered anesthetic and analgesic experimentally leads to grotesque lesions of the bone and joints, which are in every way the counterparts of tabic fractures and arthropathies; *trauma and lack of the warning sense of pain are the cause of most tabic bone and joint lesions.—Cleveland Med. Journ.*

NEURO-HYGIENE.

OVERWORK AND OVERSTRAIN.—The Committee appointed by the Minister of Munitions to inquire into the health of munition workers, having in view the immediate urgency of many of the problems which they were called upon to investigate, have published a series of memoranda. These have been followed by an interim report dealing with industrial efficiency and fatigue, which contains the results of some inquiries concerning output, lost time, sickness, etc., and with which is incorporated the Committee's Memoranda No. 7 ("Industrial Fatigue and Its Causes") and No. 12 ("Output in Relation to Hours of Work").

A good deal of attention has been devoted to the hygienic needs of the worker, and to his environment. Little attention has hitherto been paid to industrial fatigue or "staleness," their relationship to output, or their dependence upon hours of work and method of payment. The Committee have taken the evidence of various witnesses whose experience and knowledge should fit them to speak with authority concerning industrial fatigue and other matters affecting the health and efficiency of workers. "These, with hardly an exception, have been unable to point to any exact data in support or in disproof of their particular views." There has been in the past, the Committee consider, a complete absence of systematic effort to collect exact data which might prove of permanent value in the solution of industrial problems.

Fatigue, revealing itself by a diminished capacity for doing work, is not merely the expression of muscular weariness, although the symptoms are often referred to the muscles. Fatigue is a "nervous" phenomenon, the initiating and distributing nervous mechanisms becoming exhausted before the muscles; further, bodily sensations are fallacious as guides to the state of fatigue, and give an inadequate measure of it. Fatigue is measurable at any stage by a diminished capacity for performing the act which caused it, and before its signs appear plainly, or at all, in sensation. In nervous fatigue, then, it may happen that, without obvious signs and without his knowing it himself, a man's capacity for work may diminish owing to unrecognized commencing "nervous" exhaustion. The results, too, of fatigue which advances beyond physiological limits ("over-strain") not only reduce capacity at the moment, but do damage of a more permanent kind, which will affect capacity for periods far beyond the next normal period of rest.

Very interesting questions arise for solution. What is the effect of monotony in work as regards the onset of fatigue? Was the skilled craftsman of the past subject to fatigue, although (carrying his work, as he did, through one process and another to completion) he gained "interest," and was relieved from monotony? Have trade unions' restrictions been blessings in disguise? Has the "slacker" been unconsciously sharing in "a tradition of slowed labor which has necessarily arisen, probably in large part automatically, as a kind of physiological self-protection" during excessively long hours of work? An important and early sign of fatigue in the nervous centers is a want of co-ordination and failure in the power of concentration. It would be supposed that practice and training should result in increased output of work with less effort. This is not always the case.

New hands are now, after six months, producing in spite of their inexperience, not only 5,000, as expected, but 13,000 of these articles per week. The older hands do not approach this output, though all the mechanical conditions of work are practically equal. As patriotic interest in their output appears to be shared here by all the men alike, the lower output by the more experienced hands appears to be assignable only to the effects of long-standing customary restrictions upon habits or rhythm of work from which the newer hands are free.

The accumulated results of fatigue are damaging to general health, and result in "staleness." This "staleness," which results from "all work and no play," essentially differs from that associated with athletic training. The latter has almost invariably followed upon disturbance of digestive and metabolic processes, due to the attempt to load the system with an excess of highly "nutritious" food, and to reduce the quantity of fluid in the diet. Industrial "staleness," on the other hand, "is attributed almost wholly to persistent long hours and the deprivations of weekly rest. It has grave accompaniments, which paradoxically appear not only in a state of lethargy and indifference, but also in a craving for change and excitement." The condition is one to which brain workers are certainly no less liable than those whose work is manual and monotonous! A desire for change and excitement exists before the stage of "staleness" is reached, and (as the Committee remark) "hours of labor which give little chance of spending the wages earned diminish the incentive to earn more money."—*The Hospital.*

NEURO-PATHOLOGY.

TOXI-INFECTION OF THE CENTRAL NERVOUS SYSTEM.—In this interesting and important paper (*Brain*, May, 1917, p. 1) Drs. Orr and Rows continue to furnish information regarding further experiments as to the effects of toxins on the nervous system. In previous papers they have described the effects of toxins on the spinal cord, and have differentiated those produced by conveyance through the lymph stream from those conveyed by the blood. In the former inflammatory reaction is prominent, in the latter it is reduced to a minimum. In this series of experiments capsules containing cultures of staphylococcus aureus were placed in close contact with the common carotid artery in the neck of rabbits. Three brains were subsequently examined and the results were most interesting. Two types of lesion were found—(1) coagulation necrosis of the nerve cells of the cerebral cortex, cornu ammonis, and amygdaloid nucleus; (2) softening in the stratum moleculare of the cornu ammonis. Detailed descriptions of sections, with photomicrographs, are given. The conclusions drawn from a study of these changes are that both of them are dependent on disturbance of the pial vascular supply. In this they correspond with the changes observed by the authors in the spinal cord when subjected to hematogenous infection, and hence both may be attributed to the same cause. In the sections there were decided evidences of hyaline degeneration of the contents of the pial vessels, which were also dilated and engorged. In the late stages of the morbid process occlusion occurs, with consequent necrosis of the tissue supplied. This is the cause of the second of the above-mentioned morbid changes, while the first is attributed to the ischaemia preceding occlusion. They regard the hyaline changes as evidence of toxic action in the blood elements.

From some observations in these experiments they are also led to certain conclusions regarding the blood supply of the nervous system. The blood supply of the gray matter is far richer than that of the white matter. The pial arterioles supplying the latter are longer and apparently do not anastomose, so that embolism or thrombosis of them leads to immediate necrosis. The short vessels supplying the gray matter are more numerous and appear to anastomose freely, so that their obstruction from hyaline change is not attended by such wide-spread damage, though damage there is. They admit, however, that this does not fully explain all the changes observed in the cortical nerve cells, and that the question requires much more extended and careful investigation. It is sincerely to be hoped that the authors may themselves have time and opportunity to carry these to a successful conclusion.—*Edinburgh Med. Journ.*

LATHYRISM.—Stockman, *Edinburgh Med. Journ.*, in an elaborate article under this caption, not only discusses this subject from a toxicological standpoint through experiments on animals, but treats of the composition of Lathyrus (chick pea, or vetchling), of which there are three varieties, and gives a history of their use as a food, and of epidemics of Lathyrism beginning with Hippocrates, who wrote, "At Ainos, all, men and women, who ate continuously peas, became impotent in the legs, and that state persisted."

In a separate article (*loco citato*) under the caption, Lathyrism in Man, the author, aside from his own observations, quotes extensively from the literature regarding the clinical symptoms, pathological findings in man, and discusses the prognosis and treatment.

Three species of Lathyrus cause epidemic and endemic poisoning in man and animals—(1) L. sativus—cultivated lathyrus or chickling vetch*—was originally indigenous from the Caspian Sea to the North of India, and spread thence to Southern Europe, where it has long been cultivated, as well as in India. In India the peas are of two sizes, the larger of which are grown on dry wheat lands, when they are called *lakh*, and the smaller on wet rice lands, when they are known as *lakhori*. There is said to be no botanical difference, but the latter is reputed locally to be harmless, while the former is considered dangerous. The peas are eaten and the plant is used as fodder in several countries. (2) L. cicera—cicer-like** or flat podded lathyrus, or dwarf chickling vetch—is grown chiefly in France, Italy and Algeria. (3) L. Clymenum—Spanish vetch—is grown chiefly in Algeria, the Levant, North Africa, and Spain. These have different names in certain countries or provinces.

The composition of lathyrus peas as regards protein, fat, and carbohydrate content does not differ materially from that of other peas. They are much cheaper, however, as they grow on poor soil and with little or no cultivation. Hence they come to be largely used by the poor in times of famine, and it has always been in such times that epidemics of lathyrism have occurred.

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*The original English word was Chichling, but it became chickling in the eighteenth century (Murray's Dictionary). It is from the French *chiche*, scanty, hence "dwarf."

**The chick-pea (*Cicer arietinum*), a dwarf species of pea, the seeds of which are largely used in Southern Europe, Asia and North Africa for food, is not poisonous. The French call them *pois chiches*.

Action on Animals.—Pigs, Dogs, Rabbits.—The grain is known to fatten pigs well, but it is apt to bring on paralysis of the hind legs, or at least weakness and tremors, though there are conflicting feeding experiences.

Sheep, Oxen, Buffaloes.—Here, also, feeding experience is somewhat conflicting, several finding that the grain alone or the whole green plant are excellent feeding and harmless. Sheep were fed on the grain exclusively for nine months and cows on it alone for eighteen months, without injury. Others state that bullocks fed on the peas are liable to lose the use of their limbs.

Horses, Elephants.—The records regarding poisoning in horses are of special interest, and the outbreaks have several times been on a large scale. The horse seems to be specially susceptible, while the symptoms, when fully developed, are definite and constant. They consist in weakness of the lumbar muscles ("gone in the loins"), roaring from implication of the recurrent laryngeal nerves, and on exertion dyspnea or death from suffocation. Sometimes the paresis of muscles is more general, and the heartbeats may be quick and weak. When at rest the animal seems perfectly well, and the attacks come on suddenly (mostly on exertion) and subside equally suddenly. Some cases show merely weakness and tremors in the legs, or rigidity; ponies and horses stumbled about and staggered at work without any other symptom, and two of these animals could be sent staggering by a push. As in man, the symptoms appear only after prolonged feeding.

Post-Mortem Appearances Described.—The intrinsic muscles of the larynx (except the cricothyroid) were atrophied and degenerated fattily; the recurrent laryngeal nerves showed marked atrophy of the nerve fibres and an increase of the connective tissue. The motor cells in the vagal and accessory nuclei of the medulla oblongata were much atrophied. The multipolar ganglion cells in the inferior (Anterior) cornua of the gray matter of the spinal cord were very much degenerated, and the neuroglia was increased. Many of the fibres of the inferior (anterior) nerve roots were atrophied. The longitudinal fibres of the cord were unaltered. In one case the early changes of sclerosis were visible in the superior part of the lateral columns. In all, the walls of the arterioles and capillaries of the cord showed thickening.

Monkeys.—Two monkeys fed on the peas of L. sativus for several weeks remained in good health.

Birds.—Some observers state that fowls, pigeons, and partridges eat the peas freely and with impunity, but that ducks are readily poisoned. Eighteen ducks from the first day showed signs of intoxication, they later developed paralysis of the legs and finally died. Five peacocks died acutely of paralysis. Geese die readily when fed on the peas, but pigeons are refractory. Hens have been fed on the grain and remained well, but poisoning does occur sometimes.

Man.—The action on man varies greatly according to the amount eaten and the length of time the person is subjected to its action. The slighter cases merely show a certain degree of motor paralysis in the legs, which is quickly recovered from. In more severe cases the paralysis is permanent, and may involve the nerves of the bladder, rectum, and genital organs. Walking is difficult and laborious, the person dragging his legs and feet with a peculiar gait, or he may be unable to walk. The patellar and ankle tendon reflexes are increased. Sometimes sensory disturbances are present. The symptoms generally supervene suddenly, or may be preceded by pain, prickling, numbness, and cramps. The arms are very rarely involved. The general health remains good, and the paralysis does not directly shorten life. No proper autopsies have ever been made, and hence the pathological anatomy is unknown.

As very large numbers of mankind habitually eat lathyrus peas, it is certain that when they are taken as part of a mixed dietary no poisonous symptoms occur. But in times of famine and poverty an excess is very apt to bring on all the symptoms of lathyrism in every degree of severity. Men are affected to a strikingly greater extent than women, and sometimes in families and communities only certain of the males suffer. When the peas form the sole diet (Algeria) the disease appears in six to eight weeks, in one it appeared after eating for one month bread made from the flour. The Kabyles think that one part to five of other flour in breadmaking is harmless, one-third is dangerous with certainty. Most observers agree that when the proportion in bread reaches one-half, or even one-third, many cases of lathyrism develop in two or three months' time.

It is evident that the results must depend largely on the toxity of the grain used, on individual susceptibility, and on the amount eaten.

Experiments.—The author's observations were carried out by feeding experiments on monkeys, rabbits, pigs, sheep, pigeons, and ducks. A certain number of experiments were also made with an impure and pure alkaloid obtained from the seeds.

Monkeys.—In carrying out these experiments nine different lots of the peas of Lathyrus sativus were used, all grown in India. Lot 1 was obtained from the Board of Agriculture, Lots 7 and 8 from the Indian Government (they were the larger variety—lakh—grown on wheat lands in the Central Provinces, and locally reputed to be poisonous), the others were bought as "mutters" from grain merchants, and were all of the small variety. All were perfectly fresh and sound, and when sown outside yielded a good crop of L. sativus. Two of them were carefully freed from dried earth and debris, and were found to contain about 12 per cent. by weight and 15 per cent. by number of other leguminous seeds of a harmless kind. As these are round and the lathyrus seed is wedge-shaped, it was not difficult to separate them by rolling off the former on a board, and hence for the experiments it was always possible to use the unmixed peas. As the experiments progressed it became abundantly evident that the nine samples of peas differed greatly in toxicity. Lot 1, of which he had unfortunately a comparatively small quantity, was much more poisonous than the others, then came Lots 8, 2 and 4, then Lots 5, 6, 9, and, lastly, Lots 3 and 7, which were very feebly toxic. The raw peas cannot be fed to monkeys except in very limited amount, as they cause diarrhea. They require to be cooked, and the method of cooking has a very considerable bearing on their toxicity. At first the peas were steeped in cold water for a day and then boiled, the water being poured off. It is evident that this method is calculated to extract and lose part of any chemical poison which may be present, and from the water he was able to separate a small quantity of alkaloid. Later, therefore, the peas were steeped in a minimum quantity of cold water and cooked by steam. Prepared in this way they were distinctly more potent. The monkeys ate them with relish, in quantity of about 100 to 200 grams per day, and never seemed to tire of them. The only additional food given was fresh raw fruit and vegetables. It is probable that many samples of lathyrus peas are more poisonous than any which were used for these experiments, but there is no method of determining their toxicity, and they were taken as they came.

These eleven experiments reproduce in monkeys only some features of the disease Lathyrism as it is seen in man. The chief action of the poison is a paresis of motor nerves, which soon passes off if the peas be discontinued, but may become permanent after prolonged feeding, as if some slight degree of nerve degeneration had occurred. In some of the animals it was accompanied by marked wasting of muscles, in others not. In such of them as died, the cause of death was paralysis of the respiratory muscles, but in some of them the course of the poisoning was chromic, non-fatal, and painless, and the degree of paralysis was such as is seen in a human case of slight or moderate severity. In none of them was there an increase of the deep reflexes or any symptoms of spastic paraplegia. In experiment I there were symptoms pointing to an action on the spinal cord or brain. These were irritative in character, and Desparanches has described somewhat similar convulsive movements as occurring in man. In some of the experiments flexion of the joints was a frequent symptom; but it invariably passed off in a few days, and seemed to depend on peripheral paralysis of extensor nerves rather than on a central action, but this was difficult to determine with certainty. Proust mentions "contractures" in man as an early symptom.

These experiments illustrate very clearly widely different degrees of susceptibility, and this is what occurs so often in man. The time required to develop characteristic symptoms varied greatly in the eleven experiments. This did not depend on the amount eaten, as the two monkeys (IV and VII) which were least affected, had very large appetites. The chief symptoms are due to paresis of the motor nerves, and in monkeys the poison affects both the upper and lower limbs, the latter more deeply. The extreme peripheral nerves were first affected—those of the hands and feet—and, further, the extensor muscles were selected very markedly in preference to the flexors, which, however, in the more prolonged experiments, also became affected (VI, IX). Continuous lathyrus feeding seems to keep up a degree of paresis, which was often noticed to deepen about two hours after each meal, the increase passing off in other two hours or so. At intervals the symptoms become more intense for a few days, and then slacken off again. These exacerbations were a marked feature of the experiments, and during them pallor of the face often became pronounced. A very large meal (VIII, VI) or a dose of the impure active principle caused more widely spread and deeper paresis, which lasted for two or three days.

When the lathyrus feeding was stopped in the early stages complete recovery took place, but after a time recovery ceases to be complete. This is seen in Experiments V and VI, where a certain degree of paresis was permanent, and where the flexor muscles of the legs, being unopposed by the paralyzed extensors, gradually shortened, so that the knee and ankle did not extend properly, and this imparted to the animal an abrupt, jerky action of its legs and an altered gait, but this also may pass off to a large extent, or entirely (IX). After very prolonged feeding both the flexor and extensor muscles of the limbs may become paretic, wasted, and feeble, the tendency to flexion passes off, and the gait is simply shambling. In most of the animals the muscular and general nutrition remained very good, but in III and IX (for a time) all the muscles wasted, and in VI the muscles of the loins and legs became much atrophied.

The Active Principle.—Attempts to determine the nature of the poisonous principle have not been wanting. Many of these have had negative results, but others have been more successful.

Louis Astier got a definite volatile alkaloid, which he called lathyrin, but with which he made no animal experiments. He made some experiments with an alcohol extract, 2 to 8 decigrams of which given subcutaneously caused tremors, and, finally, paralysis or paresis of the hind legs in dogs.

The author was able to extract amorphous alkaloid, which gave a crystalline salt with hydrochloric acid, but only in very minute quantity, although several methods were tried. The purified salt only weighed 0.017 gram.

Summary of Results.—1. Both the large peas (grown on dry wheat lands) of Lathyrus sativus are poisonous. 2. Different samples of peas vary greatly in toxity. 3. The poisonous substance is an alkaloid, which has been called lathyrin. 4. Certain species of animals are very much more susceptible than others. 5. Individual susceptibility varies greatly in the same species. 6. With ordinary samples of the peas and in susceptible animals feeding has to be carried on for some time before toxic symptoms develop. Occasionally, however, the peas seem to be more poisonous and capable of causing more acute poisoning. 7. In monkeys and in other susceptible lower animals prolonged feeding seems to cause a greater or lesser degrees of paralysis of the peripheral nerves, along with other symptoms due apparently to an action on the central nervous system. 8. A single large dose of the alkaloid paralyzes the terminations of motor nerves, but other parts of the nervous system are also affected. 9. Histological examination of the muscles and nervous system in poisoned monkeys showed no structural changes.

Lathyrus sativus forms a very cheap and easily grown foodstuff, and the practical question of growing a constantly non-poisonous variety could be most easily worked out in India by scientific botanical experiments. As it is, many samples have a very slight toxic effect. If it is found that the peas cannot be grown free from poisonous properties, it should be possible to devise a quantitative chemical method for determining the amount of alkaloid present. Feeding experiments on monkeys are much too tedious and uncertain for practical purposes, but they could be used as a test and guide in conducting the botanical and chemical investigations. Incidentally, highly poisonous varieties may be grown, and then it would be possible to isolate a sufficient amount of the alkaloid to ascertain accurately and in detail its pharmacological action.

Lathyrism in Man.—Lathyrism in man is a chronic nervous disease due to the habitual use as food of the peas of certain species of Lathyrus (vetchlings); it occurs endemically and epidemically, and is first described in the writings of Hippocrates. The symptoms appear only after the peas have been eaten for some time, the length of time varying a good deal—probably according to the quantity consumed and the amount of poisonous alkaloid present. But individual susceptibility also appears to have a considerable influence, as only certain persons in communities and families suffer, even when all are apparently equally exposed. A striking feature in every epidemic has been the large number of men affected as compared with women—generally estimated as ten or twelve to one. Two explanations of this have been given, the one, that men habitually eat more than women, the other, that men are more exposed to cold and wet and fatigue, conditions which seem to accentuate the action of the poison.

Onset and General Symptoms.—The following symptoms are given: (1) "If a man eats lathyrus sativus for about two months he gets cramps in the calves of his legs, and if he then stops eating the grain he may recover almost entirely, or only a little stiffness of his legs may remain. He is able to walk about without the aid of a stick, but an up-and-down movement of his shoulders may be noticed when he is walking. His toes may drag slightly on the ground." (2) "If he continues eating it he may experience a somewhat sudden onset of paralysis. If he then stops eating it he will improve, and in a few weeks he will be able to move about, but with the aid of a long stick. His toes will scrape the ground, and the muscles of the back of his legs will be rigid." (3) "If he should still continue he will lose control over the bladder and rectum sphincters. If he stops, he also will improve, and he will be able to move about after a few months, but he will require to support himself with two sticks." (4) "A very small number of cases are unable to stand even with the aid of sticks."

The symptomatology varies in the reports of different writers; one summarizes the history of fifty cases which had been brought together for him to examine. All had become paralytic during the rains, in most cases suddenly, and often during the night. Men who had gone to bed quite well awoke in the morning feeling their legs stiff and their loins weak, and had never regained the use of their limbs. At first the lameness was trifling, amounting only to unsteadiness of gait and slight stiffness, chiefly of the knees. After a time the muscles of the thighs and loins commenced to ache and felt weak. There was no pain, and the legs were not much wasted. It does not tend to shorten life. Sensation to pinching was not blunted, but cold was felt more acutely in the legs than elsewhere. In some of the cases which he reports in more detail it is mentioned that the muscles of the legs were much wasted.

Another examined ten cases himself and got notes of other ten. All the cases were fully developed and had nearly identical symptoms. The onset was sudden after exposure to cold and wet, with pain in the lumbar region, often intense, and spreading to the hips and thighs. There were painful cramps, contractures, tingling, incontinence of urine, impotence and frigidity which decreased in time but never completely disappeared. The rectum was not involved. Later, there was complete loss of sensation of the legs to heat, pain and touch. The outstanding feature was paralysis or paresis of the legs, sometimes also of the loins, and rarely and slightly of the arms. Sometimes there were slight muscular tremors. There were no trophic changes and no ataxic phenomena. The patellar and ankle reflexes were much increased. He says this exaggeration of reflexes is not present at first, and appears to diminish after a time. The incontinence of urine and the sensory symptoms also disappear after some months. There is sometimes complete recovery from all the above symptoms.

The Gait.—The gait has been described in great detail by many observers. One writer describes the walk of his patients "as if stepping from one stone to another." The thorax was carried bent forward and the pelvis behind it. The feet were put abnormally on the ground because the adductors of the thighs were stronger than the abductors and drew the feet close together or even crossed them, while the heels were raised so that the body was supported on the metatarso-phalangeal joints, the great toes not being lifted, but scraping along. Walking backwards was very slow and labored, and was carried out by the hip muscles (not by the hamstrings), the motion of the leg and foot backwards being opposed by the peronei. They stood upright with difficulty and swayed unless supported.

The gait evidently varies. Some make alternate movements from each side of the pelvis; others hold the body bent forward; others make long strides.

Electrical Reactions.—The information on this head is scanty and reports indicate that electric sensibility may be decreased, increased, or normal.

Pathology and Diagnosis.—No satisfactory examination of the spinal cord and peripheral nerves has ever been made. The site of the lesion can therefore only be deduced from the symptoms and here we find considerable difference of opinion.

One writer reports that the symptoms correspond exactly with those of Erb's spastic paraplegia, and are due to degeneration of the crossed pyramidal tracts in the cord, and the disease has been referred to as "spastic paraplegia," "ataxic paralysis," "paraplegia," and also "a form of paralysis of the lower extremities," attributing the frequent sudden onset to "rheumatism" brought on by exposure to cold and wet in persons predisposed to it by a lathyrus diet. It has been considered a transverse myelitis followed by degeneration of the lateral columns, as a combined degeneration of the lateral and posterior columns, and as "tabes dorsalis spasmodica." One writer believes the seat of the trouble is in the muscles. He excised a small piece of one of the flexors of the leg and found some degeneration of the fibres. Even if the observation is correct, it is probably only a secondary change in consequence of nerve degeneration.

Treatment.—Treatment is generally said to be futile if the disease is fully developed, though well marked cases often recover spontaneously.

Treatment varies, and results of different observers contradictory, though it is evident the prognosis and treatment are far from encouraging. Late cases where the tracts in the cord are presumably permanently damaged, and in which the paralysis and deformities have become extreme, apparently hold out no hope of improvement. There is no record of treatment applied to early and milder cases, but many of them recover or improve spontaneously, and it is probable that effleurage and kneading applied to the nerves and muscles, along with electrical treatment, would materially assist recovery. In the later stages splints and other orthopedic measures properly applied would also help to overcome the contractures of muscles and get rid of the deformities and the results of these on the power of walking.

NEURO-THERAPY.

THE PHARMACOLOGY AND THERAPEUTICS OF THE DUCTLESS GLANDS PREPARATIONS.—Sajous, *Penn. Med. Journ.*, December, 1917, refers to the chaotic condition of our knowledge regarding the functions of the glands of internal secretion, discusses the different theories, and enumerates a numer of contradictory symptoms, pointing out that they are but isolated experimental results and not functions at all.

Regarding the functions of the adrenals, he gives his own interpretation of their functions as follows:

(1) That besides increasing the power of the right heart while passing through it to the lungs, the adrenal secretion on reaching the pulmonary air cells takes up the oxygen of the air, thus fulfilling the rôle of a secretion deemed necessary by various physiologists to account for pulmonary respiration; (2) that it becomes in doing so a constituent of hemoglobin which physiologists had failed to identify; (3) that this constituent of hemoglobin, which he termed "adrenexidase," possesses catalytic properties, and that it is distributed by the red corpuscles to all tissues including the nervous system, sustaining oxidation therein. This chain of events, strongly sustained, by experimental and clinical data, has, in keeping with other scientific questions, several missing links. The most important of these have been furnished recently by experimentation. These are that the adrenal principle increases the respiratory excursions of the lungs and of the chest muscles; that it augments the depths of respiration itself, and, finally, that it increases the intake and consumption of oxygen and also the excretion of carbonic acid. This respiratory function of the adrenal secretion is the fundamental principle of its therapeutical application.

Adrenalin is one of the greatest life-saving measures at our disposal in what he terms "terminal hypo-adrenia," in which either as a result of exhaustion, focal hemorrhages or hemorrhagic infarcts, torpid circulation, etc., of the adrenals, their secretory activity is more or less inhibited towards the end of infectious diseases, for instance, pneumonia, typhoid fever, scarlet fever, diphtheria and puerperal fever, in such cases as experiments now under way tend to show, the actual amount of adrenalin in the circulation is deficient, and there results weakened heart action and irregularity, tending towards failure; more or less dyspnea, unless compensated by rapid breathing; suffusion with a bluish or violet tinge of the skin, all with the typical picture of impending collapse. If, in such a case, 7 drops of the 1-1,000 solution of adrenalin in a syringeful of saline solution is injected, and 10 minims of a good tincture of digitalis, a powerful adrenal stimulant, be given orally, repeating the treatment every three hours, one will see desperately ill patients steadily return to life. We art not dealing here with mere palliatives; we are restoring the adrenal principle which the body lacks to carry on pulmonary and tissue oxidation. It does more, and through a function which, notwithstanding ample experimental and clinical proof, the prevailing teachings persist in ignoring, it takes an active part in the defensive functions. We thus obtain through the use of the adrenal principle not only a resurrection of vital activities, but an aggressive reaction against the toxins which tend to arrest them.

In the light of the physiological rôle the author attributes to the adrenals, the striking —sometimes instantaneous—effects of adrenalin in bronchial asthma, which is generally recognized as spasm of the bronchial muscles, becomes intelligible, and the results obtained in many conditions in which the vital process is depressed, such as collapse, shock, neurasthenia, Addison's disease, Asiatic cholera, etc., may also be explained.

The author believes the function of the pituitary body is that of protecting the body against certain intoxications by enhancing the activity of the other ductless glands, notably the adrenals and thyroid, the latter of which also produces a defensive hormone.

The author believes the posterior lobe of the pituitary gland is a nervous organ, a true neural lobe, not a gland, and that it is the chief co-ordinating nerve center, or ganglion, of the sympathetic system and that its function includes that of regulating the volume of blood admitted to the ductless glands, which means regulating their secretory activity and that its function can be taken up by secondary basal, bulbar, or spinal centers. As the anterior lobe is a contractile organ, much as is the spleen, it projects periodically over a layer of sensory cells, resembling those of the nasal olfactory area, a serum-like fluid in which both white and red corpuscles have emptied their contents. If this fluid contains certain poisons, the sensory cells react as do the olfactory cells when impinged upon by odorous emanations, and excite through sympathetic nerve paths the ductless glands to inordinate activity. This continues until the offending substances or toxins in the blood stream no longer irritate the pituitary sensory cells. This only occurs, however, when the poisons are broken down into eliminable wastes, that the kidneys, simultaneously stimulated, tend as rapidly as possible to excrete.

Therapeutically, pituitary preparations increase the power of cardiac contraction while slowing its rate; influence respiration and the blood pressure; act as a mydriatic; promote carbohydrate metabolism; increase the coagulability of the blood; and even inhibit intestinal peristalsis experimentally, etc. Its effects are more lasting than those of the adrenal principle; this is owing to the organic bodies with which it is combined and which amplify the range of its usefulness. It is the most efficient agent in organotherapy. It is of great value in bronchial asthma, in the terminal heart failure of infectious diseases, particularly pneumonia and typhoid fever; its effects being less ephemeral than those of adrenalin; in the heart failure of shock and hemorrhage and in the cachectic stage of Graves' disease. The neuroses, neurasthenia and the myasthenias appear to be its special field, as a valuable adjuvant to other measures. It is useful in hemorrhagic disorders, hematemesis and hemoptysis, an injection of 10 to 15 minims of pituitary acting sometimes with striking promptness, owing to its influence on blood coagulation.

The author is in accord with the generally accepted views as to the functions of the thyroid glands, such as their influence on nutrition, or hydro-carbons as represented by fats; on the cerebrospinal and peripheral nervous systems; on the gonads, or generative organs, including the mammary glands—all due to the iodin in organic combination supplied to the organism, and in conjunction with the parathyroid, as an antitoxine.

The author protests against the frequency with which thyroidectomy in Graves' disease is performed by surgeons. It is not indicated in cases due to shock, fright, etc., nor in cases due to infection. It is in the latter form, however, that due appreciation of the relationship between the thyroid apparatus and general immunity is necessary. Whether the case be traced to infection originating in the tonsils, the teeth, the gums, the sinuses, the alimentary canal or any other structure, the fact remains that this focus by initiating a defensive reaction in the thyroid apparatus simultaneously initiates the toxicosis to which the symptom complex of the disease is due. To eliminate these foci of infection and procure contraction of the thyroidal arteries while insuring absolute physical rest to reduce to a minimum the formation of tissue wastes, is to afford the patient all that which the surgeon can promise without depriving the sufferer of the greater part of one of his most important organs. The same process prevails in the initial development of goiter, also the result of some underlying intoxication which evokes a degree of defensive response on the part of thyroidal tissues exceeding their normal capacity, and entailing therefore hypertrophy. If the cause, whatever it may be, endogenous and exogenous, is removed sufficiently early and before local degenerative changes have had time to develop, the goiter may disappear completely.

Therapeutically thyroid preparations enhance oxidation, they have often been shown to raise the temperature, sometimes several degrees, increase the oxygen intake and the carbon dioxid output sometimes over 20 per cent., augment nitrogen and phosphoric acid excretion. Graves' disease includes all these symptoms. Conversely thyroidectomy lowers oxidation, the output of carbon dioxid, nitrogen, phosphoric acid, and other familiar symptoms of myxedema being increased. The effects of thyroid gland in the latter disease and cretinism sufficiently emphasize the influence of the thyroid on general metabolism as shown by the beneficial effects of thyroid gland in osteomyelitis, a result which further sustains the now well-established influence of the thyroid apparatus upon calcium metabolism.

A cardinal point in the use of thyroid preparations is that of dose; a small dose of thyroid gland is invariably useful in appropriate cases because it enhances metabolism, and that conversely large doses are invariably harmful in all cases, because by stimulating catabolism excessively they disturb the metabolic equilibrium. In practice the use of thyroid gland and pituitary gland gives better results where thyroid is indicated than the latter alone, whether we deal with obesity, rheumatism due to hypothyroidea, various dermatoses of the erythemato-bulbous type, the eczema of young children, osseous disorders in which defective nutrition prevails, osteomyelitis and suppurative processes, general hemophilia or any other hemorrhagic disorders. The author believes it a mistake to abandon other tried measures; the best results are obtained by those who administer glandular products with a view of sustaining and even upbuilding the foundation of the organism while enhancing its defensive resources, thus aiding the well-tried therapeutic agent employed.

THE TREATMENT OF LOCOMOTOR ATAXIA BY THE MALONEY METHOD.—Wolf, *New York Med. Journ.*, 1917, Vol. CVI, p. 121, considers that the method of Dr. Maloney has practically done away with all the shortcomings of the Frenkel method. There are two basic principles on which Maloney has founded his treatment, relaxation and re-education. It is immediately noticeable, on looking at a tabetic, that all his attention is focused on his walking and that he keeps his entire body stiff. This is due to fear. The patient is conscious of the lack of natural control when he is walking and tries to compensate for it by keeping all the muscles, even those that are not needed for the particular action, in a tense state. The Frenkel method has tended to increase this tension. Maloney, however, set out to combat this and accomplish it by his method of relaxation. The difference between the Maloney treatment and the Frenkel treatment is very great and it lies particularly in the fact that the pure routine procedure, as it is practiced according to the Frenkel method, is impossible. Each joint and each part must be treated according to its condition. Resistance exercises must be graduated according to the strength of the muscles; the strength of the weak one must be educated up to the strength of the stronger one to produce the proper balance. Only after sensation has been improved can we proceed to crawling and walking exercises.—*Am. Jour. of Syphilis.*

THE ADMINISTRATION OF SALVARSAN IN CONCENTRATED SOLUTIONS.—Smith, *Journ. of Mich. State Med. Soc.*, April, 1917, believes that the use of concentrated solution of salvarsan minimizes or does away with the ill effects due to imperfect distilled water, thus obviating one of the greatest dangers inherent in the hitherto accepted method. The fact that no apparatus is required except a syringe for salvarsan injections provides a great simplification of technic not only as regards bulk of apparatus but also as regards sterilization. There is reason to believe that concentrated solutions are more effective than dilute ones, in that the salvarsan in the former case is more slowly excreted. For the nervous patient, the intravenous injection of a syringeful of medicine is a procedure less taxing than the injection of a large quantity. This new method surpasses the old both in being a great saving in time and also in enabling the operator to dispense with the services of an assistant.

One objection to the new method consists in the urgent necessity of a perfect technic in the intravenous injection itself. It is obvious that if the needle does not lie accurately within the vein, so that a small amount of the concentrated solution enters the perivascular tissue, the results may be even more disastrous than with the more dilute solutions. This danger must be faced, of course, but need not deter the skillful operator. The degree of concentration permissible with salvarsan is a 1 to 3 per cent. solution which is perfectly well borne. By the use of a small needle there is less danger of phlebitis or periphlebitis.—*Amer. Journ. of Syphilis.*

INTRASPINAL MEDICATION IN THE TREATMENT OF SYPHILITIC DISEASES OF THE NERVOUS SYSTEM.—Lewis M. Gaines, *Medical Record*, 1917, Vol. XCI, p. 1,034, writes that the type of case which is benefited is first of all the early case of no matter what type. As a rule those showing meningitic involvement as evidenced by high cell count and globulin content have a better prognosis. All agree that intraspinal therapy is practically free from danger, when due care is exercised in the preparation of the serum, in the technic of the administration, and in the after-care of the patient. Fully 10,000 intraspinal injections have been given by those quoted in this paper, and only two or three unfavorable reactions have occurred. There are now in vogue three principal methods of intraspinal therapy, the Swift-Ellis method, the Ogilvie method, and the use of mercurialized serum. Each method has its advocates, but the general trend of opinion seems to be in favor of the Ogilvie method. Good results are being obtained by all methods. The method of intraventricular therapy using serum prepared by Ogilvie's technic is reported only by Cotton and used by him in paresis. This method should merit much interest and promises unusually good results. The question of when to use intraspinal therapy is of importance. Many of those quoted in this paper use it in cases of neurologic syphilis when other methods fail. Others, including the writer, feel that valuable time may be saved in using the method from the beginning, especially in tabes and paresis, while in cerebrospinal syphilis, intravenous salvarsan, mercury and potassium iodide may first be tried. Provided the method is used early and energetically and frequently, the four reactions may be rendered permanently negative. In many cases, however, the Wassermann remains positive, though the cell count and globulin content are reduced to normal. Even in the presence of a positive Wassermann, there is frequently clinical improvement or apparent cure, while in the serologically negative cases there is corresponding clinical improvement. Those with the most extended experience now advocate intraspinal injections, every one to two weeks, or the intravenous injections once or twice a week, until the four reactions become negative. One should not conclude that a case is Wassermann-fast until after a prolonged trial of from 10 to 20 injections. Finally it must be emphasized that the early cases are the hopeful cases. Dead tissue cannot be revived, but cases in which the disturbance is due to inflammatory reactions in the central nervous system, especially where meninges are bearing the brunt of the infection, are those in which brilliant results may be expected.—*Amer. Journ. of Syphilis.*

ELECTRICAL TREATMENT OF INFANTILE PARALYSIS.—Grubbe, *Ill. Med. Journ.*, December, 1917, makes a plea for the more extensive use of electricity in infantile paralysis.

The author states there are only three remedial measures to overcome the paralysis and prevent deformity, viz., massage, passive motion and electricity. Of these electricity is the most useful, and the "only logical and natural remedy available at the present time."

The principal advantage of electricity over massage and passive motion is due to the fact that the former promotes the passage of nerve impulses as well as retards muscle atrophy, whereas the latter two remedies have no stimulating effect upon the nerves. In addition to the mechanical contractile effects upon the muscles electricity also possesses chemical properties which act as a powerful stimulant to the nutrition of all tissues in the affected region. Finally electrical treatment when compared to other treatments is precise, not haphazard. With electricity we can pick out and treat individual muscles. On the other hand, with massage or passive motion we treat the normal as well as the sick muscles; we treat groups rather than single muscles; we treat arms and legs rather than the particular parts which control these comparatively large areas.

Electrical treatment of infantile paralysis must be considered from two distinct standpoints. First, electricity can be used to prevent primary muscle atrophy which is due to lack of motion, and second, it can be used to prevent progressive muscle atrophy and the deformity which would result therefrom.

Electricity is the only agent known which is capable of producing muscle contractions similar to those voluntarily produced by the patient. Furthermore, what electricity does to these muscles is all that needs to be done; all other treatment should be considered secondary and usually does more harm than good.

Electrical treatment is not to be used during the acute stage of the disease; it is called for only when there is positive evidence of atrophy or paralysis. Strictly speaking electricity is not a remedy for all infantile paralysis; it is rather a remedy to combat and limit the sequelae of this disease.

As long as tenderness is present in any muscle the patient should rest, if necessary, with the aid of well fitted supports or splints. Usually electrical treatment can begin at the end of the second week of the disease. Atrophy is not an early symptom. It usually shows a week or more after the disease has started and when it begins it proceeds slowly. But we must never wait until there is decided atrophy before beginning electrical treatment. By waiting too long we give time for the development of atrophy often so profound that it may not be checked in time to prevent deformity. I am convinced that by proper electrical treatment, begun in time, atrophy can be almost entirely prevented.

In a given case to absolutely settle the question of whether there is or is not a state of muscular weakness we make the electrical reaction test for degeneration. This gives both qualitative and quantitative information pertaining to each muscle or group of muscles tested. This test can be made without harm to the patient and should, therefore, be used more frequently than it has been in the past. Only by this means can we accurately locate the limits of the paralysis. If electricity did nothing else for infantile paralysis but locate accurately the muscles or groups of muscles which need treating it should be welcomed, for it will have a very big field of usefulness—a field in which it has no competitors.

Electrical treatments must be properly given or they will do more harm than good. Fatigue, that destroyer of what muscle function is left, can be produced by too much or too long applications, therefore treatments should be given by someone well versed in both anatomy and electricity.

The methods for applying electric currents in infantile paralysis are numerous and usually quite unscientific. When we realize that this is primarily a disease of the nervous system we must conclude that the nerves need treatment as well as the parts controlled by them, *i. e.*, the muscles. The common way for applying electricity which consists in trying to locate the points of origin and insertion of a muscle by means of the electrodes is wrong because the nerve controlling the muscle is not considered in the treatment. The nerve needs treatment more than does the muscle and should receive our serious attention.

The scientific way to give electricity in infantile paralysis is to apply the electrodes to the nerves controlling the affected muscles. This can be done by locating the motor point on the muscle with one electrode and allowing the electricity to enter at that place. The other electrode, known as the indifferent one, should be placed at the spine as near the exit of the affected nerve as is possible. This disease involves that area of the spinal cord which controls the motor nerves—the anterior horn, hence the importance of exciting muscle action through the motor points of the nerves which are located on the surface of the affected muscles.

The author uses only galvanic and static currents to the exclusion of all others. In a given case the choice will depend largely upon what the reaction test for degeneration has shown. If the test shows fair excitability of the muscle under galvanic current then this is the current to use in treating the case, otherwise the static current is preferred. In adults the writer uses the static current, no matter what the degree of paralysis. Its application is more convenient for both patient and operator.

The quantity of current depends upon the individual muscle under treatment. The smallest amount which will produce muscle contraction is all that is allowable. In order that the contractions may be accurately observed a good light is very desirable. From 2 to 5 milliamperes will usually be found sufficient quantity to produce visible contractions.

In giving static electricity the following technic is used: Leyden jars are attached to the machine. The prime conductors touch each other. One pole of the generator is grounded and the other, attached, to a small metal ball which is held in the operator's hand by means of a well insulated handle, is placed upon the various motor points. The rhythm of contractions is dependent upon the speed at which the machine runs and is the same for the different muscles as that given previously under galvanic treatment. To regulate the amount of current the prime conductors are separated—the larger the air gap between them the greater is the volume of current available for excitation of the muscle. A one-half to one inch spark gap between the prime conductors is suitable for the muscles of the hand or foot; 2 to 3-inch spark gap for the muscles of the arm or leg; 3 to 4-inch spark gap for the muscles of the abdomen or back. With either static or galvanic currents the treatments are given daily. When improvement appears the interval between applications may be lengthened. Naturally, in children the difficulties of applying electricity are great and one must overcome the little patients' fear by patience. Too much should not be attempted at the first sitting and only weak currents should be used until the patient acquires confidence.

The time during which benefits may be expected from electrical treatment is unlimited; even in old, long-standing cases, persistent, scientific application of the proper electric current will bring back considerable control and strength in the paralyzed parts. This will appear reasonable when you recall that every muscle is connected with more than one nerve center, and, although one particular nerve center may be completely destroyed, others may be only damaged.

Remember that regenerations of nerve tissue is natural and needs only slight but proper assistance in order that permanent beneficial results may be brought about. Therefore, it may be said that it is never too late to begin electrical treatment in any case of paralysis. Of course, in these old cases improvement should be expected only after many months continuous treatment.

PSYCHOLOGY.

Psychological Parallelisms Between Speech Disorder and Oral English.—Swift, *Quar. Journ. of Public Speaking*, Vol. III, No. 3, July, 1917, writes that a study of speech defect in the varying degrees of psychological content, with corresponding change of brain background shows that the psychological content corresponds to the amount of oral output.

A study of a variety of types of speech defect shows that the output varies somewhat according to the type within the class.

Brain structure, psychological content, and oral output thus run pretty constantly parallel between different classes of mental defectives. This shows that in the background we have a pretty firm establishment of a mental type with which we must deal.

In what we term the normal individual, structure, psychological content and oral output therefore run vaguely parallel in normal types and are only partially educable, changeable, variable, but are mostly fixed, fatalistic, and firm.—*Author's Abstract.*

PSYCHO-THERAPY.

THE TREATMENT OF PARESIS.—Evans and Thorne, *New York Med. Journ.*, 1917, Vol. CVI, p. 437, report that twenty-three patients were subjected to a series of intraspinous treatments with salvarsan, neosalvarsan, and albuminate of mercury. The smallest number of injections given to one patient was three, and the largest number twenty. The Wassermann reaction was temporarily reduced to negative with the blood serum of one patient and with the cerebrospinal fluid of three. Three patients showed some mental and physical improvement; ten died, four during the course of treatment and six several months after the treatments were discontinued; ten are living and are markedly demented. The authors have found that the intraspinous method of treating paretic dementia has had little or no therapeutic value in their series of cases.—*Amer. Journ. of Syphilis.*

BOOK REVIEWS.

THE PRINCIPLES OF MENTAL HYGIENE.—By William A. White, M. D., with an introduction by Smith Ely Jelliffe, M. D., Ph. D. The MacMillan Company, New York City, Publishers. Price, $2.00.

The title of this work gives no adequate idea of its scope which, aside from the subject of Mental Hygiene, embraces not only the development of the individual from an automaton to a fully developed anatomical, physiological and psychological unit, but also studies him as a social being which necessitates delving into the realms of sociology, criminology, economics and forensic medicine.

Thus it may readily be seen how inadequate must be the work of the reviewer.

Considering some of the practical every-day problems: A timely subject is the method of the commitment of the insane. The impracticability, in many instances, of the present-day methods which necessitate court proceedings, is certainly well known to all.

The hypothetical question is also considered in its tendency to "consider the act rather than the actor," though no recommendations are made to remedy existing conditions, mainly, perhaps, because that is impossible without causing the expert to pass upon the mental condition of the subject, thus usurping the function of the jury—a fact apparently not recognized by many writers on this subject.

The author recommends that practitioners of criminal law should attend clinics in psychiatry and take courses in the psychology of evidence, human behavior and sociology with special emphasis on criminology, and that the presiding attorneys should spend one year to eighteen months as interns in one or more penal institutions and thinks the latter desirable for judges of criminal courts, though we fail to find an equally stringent, though apparently equally desirable, legal course outlined for the medical expert.

As a matter of social economy, a timely note is struck in the re-education of those who, through disease or injury, are incapacitated for their vocation.

In brief, the work contains much "food for thought," and doubtless considerable material for practical application and as we view the work in retrospect, we are reminded of the Irish prisoner who upon receiving a sentence of thirty days in jail referred to it as an epigram, *i. e.*, "A sentence that seems short but gives you plenty to think about."

D. S. B.

DREAM PSYCHOLOGY.—By Maurice Nicoll, B. A., M. B., B. C. (Camb.), Capt. (Temp.) R. A. M. C. Published by Henry Frowde and Hodder & Stoughton, Oxford University Press, Warwich Square, London, E. C.

This little volume of some two hundred pages is devoted to the study of dreams and their interpretation with all that subject means to the psychanalysist. The author compares dreams to cartoons which are a language of symbolisms which have a latent meaning in a condensed form and which require a certain knowledge of the subject matter before they can be read or understood: though the interpretation of a dream is much more difficult than the interpretation of a cartoon, since the same dream in several persons may have as many different meanings as there are dreamers.

The author does not agree with Freud that a dream always contains a wish-fulfillment, but believes in what is termed the compensatory theory which views the fantasy "as an attempt to provide what is lacking in reality, and is protestive in meaning."

The subject of the interpretation of dreams receives the greatest attention and is clarified by numerous examples.

D. S. B.

DISEASES OF THE NERVOUS SYSTEM.—A Textbook of Neurology and Psychiatry. By Smith Ely Jelliffe, M. D., Ph. D., Adjunct Professor of Diseases of the Mind and Nervous System, New York Post-Graduate Medical School and Hospital and William A. White, M. D., Superintendent of St. Elizabeth's Hospital, Washington, D. C.; Professor of Nervous and Mental Diseases, Georgetown University; and Lecturer on Psychiatry, U. S. Army and U. S. Navy Medical Schools. Second edition, revised, rewritten and enlarged; illustrated with 424 engravings and 11 plates. Messrs. Lea & Febiger, Philadelphia and New York, Publishers.

The rapid advance in the domain of neurology, much of which is incident to our increasing knowledge of the vegetative nervous system, the endocrine glandular system, laboratory methods and of the newer conception of the neuroses, necessitates the frequent revision of textbooks on this subject and, as the title of this work indicates, it covers the entire field of nervous and mental diseases, it should find favor with the progressive physician.

This work contains over 900 pages, of which a generous space—80 pages—is devoted to the examination and case taking, in which is an outline for case records, and the generous space given to the vegetative nervous system and the endocrine glands is commensurate with their importance and our present knowledge of their functions and reciprocal relations and antagonistic action.

"Railway spine" and "traumatic neuroses," *sui generis*, in accord with neurological advance, are conspicuous by their absence; while trauma unaccompanied by organic lesions is considered no more than a precipitating or contributing cause of the neuroses or psychoses and "oftentimes the injury is the result rather than the cause, * * * * the injury serving to call attention to the presence of the disease up to that time not recognized."

Regarding neurasthenia we read, "there are a large group of cases which are supposed to be dependent upon injuries, traumatic neurasthenia, and another large group that is supposed to be due to overwork. Although it is not quite possible to speak dogmatically with regard to the traumatic group at this time, still from analogy, as the result of cases studied in the group supposed to be dependent upon the group of overwork, it will be seen that the same reasoning applies to both and it is again the same reasoning that may apply to anxiety neuroses, or in fact to any of the conditions described in this chapter, but more particularly perhaps to the actual neuroses. The traumatism or the overwork, as the case may be, or any other apparent assigned cause can be said not to be the true cause of the neurosis but only its occasion. The traumatism or the overwork could not produce the neurosis in the absence of the specific etiology."

The work is profusely illustrated with a number of excellent colored plates and schematic drawings though a few of the latter of necessity are so complicated, if not involved, that it seems, in the interest of ready reference, they might have advantageously been replaced by charts.

Though this is a highly meritorious work, we were particularly impressed with the articles on migraine; diseases of the auditory and vestibular nerves; cerebellar syndromes; syphilis of the nervous system, including paresis, tabo-paresis and tabes, and epilepsy, which are especially illuminating.

D. S. B.

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THE SYNDROME OF CONUS MEDULLARIS AND CAUDA EQUINA APROPOS OF A CASE OF HEMI-LESION.

By

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LESIONS strictly confined to the lowest segment of the spinal cord are not frequently observed. The modern war, however, has increased the number of such cases because of the explosives and shells which reach the spinal column and cord either posteriorly or through the abdominal wall. The literature is now abundant with examples of this kind. Apart from the traumatic cases, affections of the conus medullaris or of the cauda equina, or of both, are quite rare. Still less frequently do we observe hemi-syndrome of this portion of the central nervous system.

As it is well known, syphilis may affect the nervous system in a great variety of forms, so that it may simulate almost any well-established affection of the brain or spinal cord. Nevertheless, syphilitic lesions confined unilaterally to the conus and cauda are comparatively rare. The following case, therefore, presents an unusual interest from this standpoint:

L. F., aged 38, business man, contracted syphilis at 20. Eighteen months before coming under my observation he developed the following symptoms: After a hard day's work, associated with much walking, he felt a numbness in the lower limbs and difficulty in micturition. After a two days' rest the numbness improved but the micturition remained unaltered. Soon he commenced to complain of pain in the right leg from the knee down. The pain was very severe. Instead of retention he rapidly developed incontinence of urine and obstinate constipation. The walking became difficult, and he was compelled to give up his work.

At the time of my examination his condition was as follows: The gait is difficult because of the foot drop on the right. It is also in the position of equino-varus. The flexing of the right thigh on the pelvis and of the right leg on the thigh is not difficult while the patient is in bed, but he does it with difficulty while standing or walking. The left lower extremity is normal. It is difficult for him to rise from a seat or go upstairs. The knee-jerk on the right is greatly diminished and Achilles reflex lost. Both reflexes are normal on the left. Toe phenomenon is absent on both sides. The right leg and foot are cyanosed, cold to touch and there is an ulceration near the external malleolus of three months' standing which shows no tendency to heal. The muscles of the right lower extremity and gluteal region are flabby and diminished in size. Reactions of degeneration are present in the right gluteal muscles, but not in those of the right lower limb where only a diminution of contractility to both currents is observed.

Sensations. (Fig. 111.) The pain which the patient experienced at the beginning has totally disappeared, but he feels a numbness in the sole of the right foot; the ground is not solidly felt by him. On the left the sensation is normal. The test for objective sensory disturbances presents the following findings: The *touch* sense is normal. Pain and temperature senses are abolished on the right side of the anus, perineum, scrotum, penis, internal and posterior surfaces of the thigh down to the popliteal region, also on the lower half of the gluteal region. On the scrotal region and penis heat is taken for cold, but cold is not felt at all. The dorsum of the foot is also thermo-anesthetic, but pain sense is preserved. Incontinence of urine and feces is quite pronounced. A finger introduced into the anus feels but a very slight contraction of the sphincter. A catheter introduced into the urethra shows almost complete anesthesia. The patient is impotent. Very occasionally there is erection, but after the latter has subsided a slow seminal discharge follows without the usual sensation.

An analysis of these symptoms leads to the following deductions: Patient has great difficulty on the right side in rising from a seat and in going upstairs, the right gluteus maximus is therefore involved (small sciatic nerve). The other gluteal muscles are apparently not at all or very little affected, as abduction and circumduction of the right thigh are preserved (the gluteal nerves are therefore not involved). As flexion of the right hip-joint is possible, the right psoas and iliacus muscles are not involved, the lumbar nerves for the first and the anterior crural nerve for the second are consequently intact. Crossing of the right leg is possible; the pectineus and all adductor muscles (the obturator nerve and the great sciatic nerve for the adductor magnus) are therefore

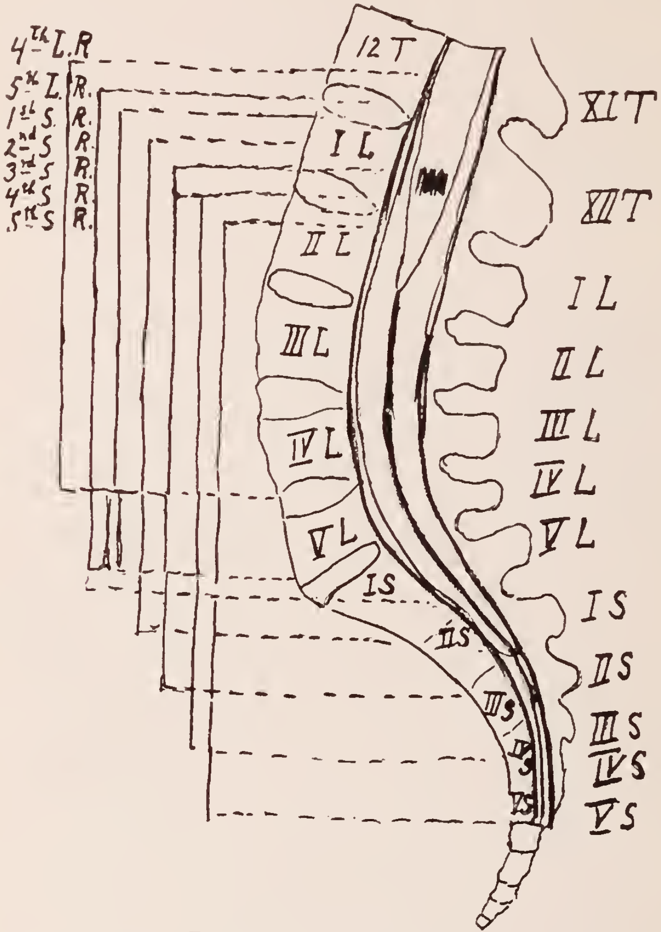

FIG. I. (After Raymond.)

The straight vertical lines indicate the length of the intravertebral pathway of the last two lumbar and of the sacral roots.

not involved. The extensors of the knee (vasti and rectus muscles) and the anterior crural nerve are not involved. As it was mentioned above the patient can flex his knee while in bed, but he cannot do it easily while walking. In bed the flexion of the thigh (which is not disturbed) is sufficient to permit the weight of the foot to flex the knee. The flexors of the knee (biceps, semitendinosus and semimembranosus) and consequently the great sciatic nerve, are therefore involved to a considerable extent. The gastrocnemius and soleus (internal popliteal nerve) are involved as the foot is in equino varus, the tibialis anticus and consequently the anterior tibial nerve, are involved (the action of the peroneus longus is antagonistic to that of the tibialis anticus); and as a paralysis of the peroneus brevis leads also to talipes varus, it is supposed that the musculocutaneous nerve is also involved. The condition of the toes finds its explanation in the paralysis of the extensor longus pollicis. This detailed analysis of the condition of the muscles of the right lower limb shows that the following nerves are disturbed in their function; small sciatic (gluteus maximus muscle), great sciatic nerve (flexor muscles of the knee) and various branches of the latter. The motor disturbances are therefore in the domain of the sacral plexus, which is formed by the fifth lumbar and four sacral nerves.

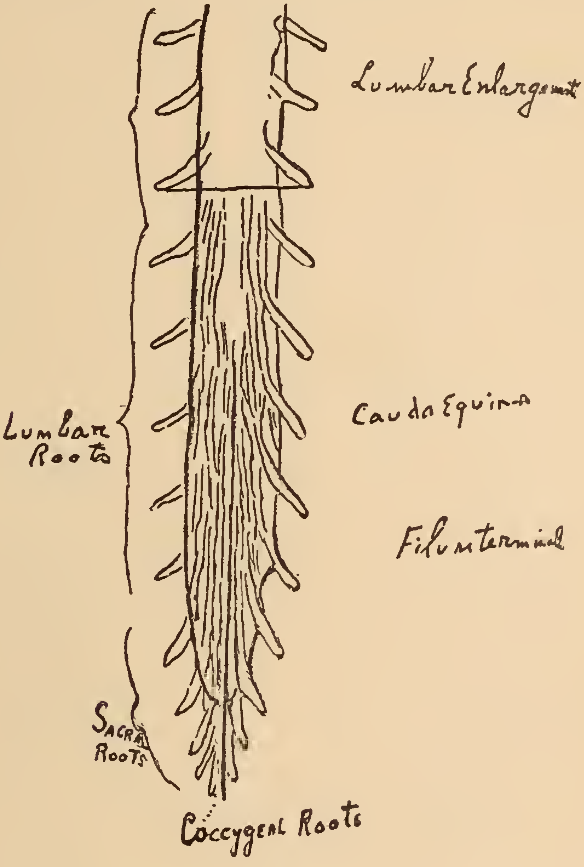

Fig. II.

If we turn our attention to the sensory disturbances, we observe that the right side of the perineum, and of the anus, the penis, right side of the scrotum and the mucous membrane of the urethra, are all analgesic and thermo-anesthetic, which is indicative of an involvement of the pudic nerve which again is a branch of the sacral plexus. The condition of the bladder, rectum and anus shows an involvement of the accelerator urinae, compressor urethrae, external sphincter and levator ani; these muscles are all supplied by the muscular branches of the pudic nerve. The patient's sexual power was considerably diminished since the onset of the disease, and ejaculation is involuntary, and not felt by him. The erector penis is supplied by the pudic nerve. The sensory disturbances of the lower extremities are also disturbed over the domain of the sacral plexus.

When an attempt is made to localize the lesion in the present case, one must take into consideration the anatomic arrangement of the sacral plexus and its relation to the spinal cord itself. The sacral plexus is formed by the fifth lumbar and the first four sacral nerves. A glance at the diagram (Figs. I and II) will show that the origin of these nerves corresponds to a portion of the cord which is situated between the lower portion of the 12th thoracic and the middle portion of the 2nd lumbar vertebrae. The very lowest portion of this segment is called conus medullaris. It comprises the last three sacral segments and the coccygeal segment. The pointed end of the conus continues in the form of filum terminale, which together with the surrounding nerves descending from the lumbar and sacral segments of the cord, called cauda equina, fill the lower end of the spinal canal from the third lumbar vertebra down to the coccyx. It is evident that a lesion affecting the cauda at the level of the conus may involve also the cord itself and this is the reason why the symptomatology in such cases is complex. A lesion must be in that portion of the cauda which lies below the lower end of the conus, if a clear case of disease of the cauda is to be made out. A disease of the cauda above that point presents almost always symptoms of a mixed character; those of sacral and lumbar plexuses and of the spinal cord.

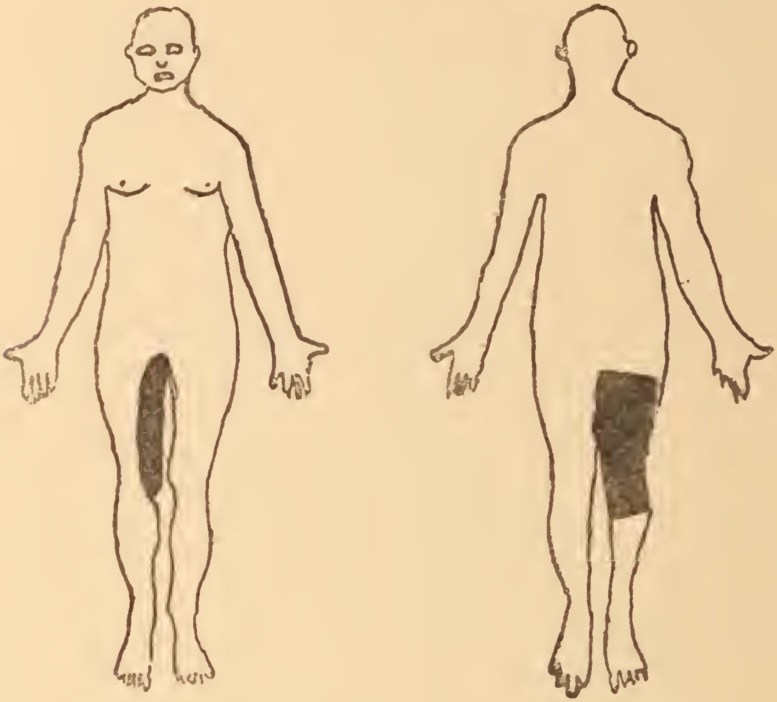

Fig. III.

▨ Analgesia and Thermoanesthesia.

From a clinical standpoint, therefore, several varieties may be observed. 1st. There may be cases, such as tumors of the filum terminale producing eccentric compression upon the nerves distributed in the bladder and rectum. The symptom-group in such cases will be reduced to a paralysis of one or the other viscus. 2nd. In other cases the vesico-rectal paralysis may be associated with an anesthesia of the penis and scrotum in men, or the labia majora in women, of perineum, anus, the lower gluteal portion and the postero-superior portion of the thighs; there is frequently also loss of genital function in man. In this group of cases the lesion lies in the conus, and the roots emanating from the latter suffer simultaneously. In a 3rd group of cases there may be an association of the above symptoms with sensory-motor disturbances in the lower extremities, and precisely from the mode of distribution of the latter that the topographical diagnosis can be figured out in any given case.

In applying these anatomo-physiological data to the present case one is enabled to place it in one of the categories enumerated above. We find here a combination of the symptoms referable to a lesion in the conus and of symptoms referable to a disorder in the roots emanating from the conus. On the other hand, a compressive or an irritative extra-spinal lesion of the roots after they leave the conus may give a similar syndrome. A differential diagnosis is, therefore, essential. But for better elucidation of this particular feature of the subject it appears opportune to first present the further course and termination of the disease in my patient.

As he first came under my observation in the presalvarsan era he was placed on mercury and iodids. Later on he received several injections of neosalvarsanized serum by the intraspinal route. A prolonged course of massage and systematic exercises improved the condition greatly. He was able to move about and finally discarded crutches and cane. Flexion of the leg improved and finally he began to move the toes and ankle. The ulceration healed up. The most persistent condition was the incontinence of urine and feces. It is only last year that some improvement was noticed in the control of the rectum. The patient commenced to feel a fullness near the anus which gave him the signal for a bowel movement. This condition remained unaltered. The analgesia and thermo-anesthesia remained. The greatest amount of improvement was observed in the motor power. He derived great encouragement from the latter and he soon returned to his former occupation. Six years later he contracted pneumonia and died. Autopsy was not permitted.

In making a differential diagnosis, one must consider a nuclear lesion of the conus and a radicular lesion. *A priori*, we must admit that in cases of destructive lesions of the cord the symptoms must become progressively more pronounced and that the opposite is observed in cases with lesions of the cauda. In a case published by Schultze the diagnosis was made by Erb of a disease of the cauda equina, but at necropsy an intraspinal lesion was found. Schultze himself observed a case of traumatic lesion of the cauda which ended fatally in a few weeks. It is evident, therefore, that a progressive or retrogressive course of the condition cannot serve as an important differential element.

The presence or absence of pain has been considered as a diagnostic guide. Pain in the sacral region radiating in the lower extremities is usually indicative of a radicular lesion, but according to Schiff transitory pain is possible in diseases of the conus, although total absence of painful phenomena militates against a radicular lesion. *Ztschr. f. klin. Medizin*, 1896, p. 87.) In Westphal's case (*Charite-Annalen*, 1876, t. I, p. 421) there was a radicular lesion, although during life there was a clear-cut picture of disease of the conus.

The state of sensibility has been considered by some writers as a differential sign. They claim that the dissociated character of the anesthesia is indicative of a nuclear rather than of a radicular lesion. (See Higier, *Deutsche Ztschr. f. Nervenheilkunde*, 1896, t. IX, p. 185.) But sensory dissociation may be observed in other affections of the nervous system, such as polyneuritis, for example.

These few considerations concerning the symptomatology leads to the conclusion that there are no pathognomonic differential elements which could be relied upon as infallible in nuclear affections of the conus and in radicular lesions at the same level. A close reading of the records taken by careful observers shows that the majority of symptoms referred to the function of the cauda itself are met also in cases described in diseases of the conus. Moreover, pathological records show that whenever the lesion is not strictly limited to that portion of the cauda which surrounds the filum terminale but extends to its upper portion, namely, to that which surrounds the conus, the diseased process affects the cauda as well as the cord.

Lesions of the conus and cauda at various levels will present a large variety in their chief manifestations. The records collected in the present war demonstrate several possibilities of injury to the lowest portion of the lumbar enlargement and the cauda equina. Thus we may have an upper or lumbar type, a lumbo-sacral type, an inferior sacral type and an isolated cauda type. The symptomatology will vary according to the precise localization of the lesion. What especially characterizes all these forms is the disturbance of the sphincters and of the genital functions. In the lower sacral type we observe in addition to the above symptoms also anesthesias in the ano-perineo-genital region. The distribution of the disturbances in the motor sphere, in the reflexes, in sensations on the gluteal region and on the limbs, the distribution of pain, the seat of amyotrophic disorders, are all phenomena in relation to the particular area or muscles involved and therefore in relation to the nerves supplying these parts. If the latter are correctly determined, the segments of the cord from which they originate are easily figured out. While the types mentioned are distinct, nevertheless we meet also with intermediary cases.

The present war has also supplied examples of hemi-involvement of the conus medullaris and cauda equina. Here we find the motor and objective sensory disturbances confined to one side. The sphincters are always involved and persist during many months. The reflexes are also disturbed on one side. Irritation of the anus on the affected side does not produce contraction of the sphincter (J. Lhermitte, *Progrès Medical*, No. 32, 1917, p. 267). Outside of cases due to trauma, hemi-manifestations of the conus and cauda are not frequently observed. To the latter group belongs my case described above. The initial symptoms, the mode of their development, the character of the sensory and motor manifestations, the trophic disturbances, are all strong indications of a simultaneous involvement of the nuclear and radicular portions of the conus medullaris. As to the nature of the affection, it is probably a syphilitic meningomyelitis of the conus and of its roots.

The prognosis in the isolated affections of the conus and in those of the cauda equina must naturally differ. In cord involvement the outlook is uncertain, if not even hopeless; while affections of the cauda equina always present a hopeful picture. The reason of this capital difference lies in the regenerative processes in the cord tissue and in nerve-roots. In the latter, the process is persevering and progressive; in the former, it is irregular and insufficient (see G. Roussy, *Bulletin de l'Académie de Médecine*, Nov., 1915).

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SIMPLE ADOLESCENT DEMENTIA.

(The Etiology of Pathological Indolence.)

By

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I PURPOSE to describe and discuss a not infrequent type of adolescent insanity, slow in onset, without hallucinations or delusions, never presenting any acute exacerbations, never intermitting, not arising from any known exogenous cause, running a course of indefinite length, never recovered from, but ceasing to progress at any stage.

Every now and again a father brings his son to a physician, saying that he does not understand why his boy, varying in age from, say, sixteen to twenty years, does not get his work or study done, does not hold a position for more than a few weeks, does not keep up with his class at high school or college, is losing or has lost interest in everything and has changed into an idle and lazy youth. Superficial examination shows the lad is mentally sluggish, emotionally unstable, and definitely asocial. The father is the more perplexed, because, as a small boy, indeed until after puberty, the lad was as bright and ambitious as other boys, not quarrelsome, not moody, and no more disobedient than a healthy boy ought to be, and because he has no known bad habits, save one which will be mentioned later, has not become wild in any way, is not untruthful and seemed till recently to desire diligently to attend to his duties. The change in character has not followed, as insanity sometimes does, any acute illness. On the contrary, the youth has never been ill. He has never been subjected to any strain or stress, though as a child, we are sometimes told, he was over-sensitive. The paternal perplexity is tinged with anger, because the boy shows to the father no evidence of physical disease, is, on the contrary, from the father's point of view, robust, eats and sleeps well, indeed sleeps too much, and yet is not amenable to reason and behaves as if he were wilfully lazy, showing none of the symptoms of mental illness with which the father is acquainted. The physician is rarely called upon for advice until the relations between father and son have become more or less strained and usually, though by this time the father fears illness, he suspects that the real cause of the trouble is habitual masturbation and therefore thinks the youth is blameworthy, having brought his trouble on himself.

Instead of reciting a series of case histories I shall give a composite sketch made from many patients; illustrating the development of the clinical picture. The family history of patients seen in private practice, and it is only in such that a correct and exhaustive history can be obtained, always reveals some mental disorder, usually veiled and unsuspected, in parent or grandparent or nearly related collateral relatives, and not infrequently there is a bad strain present in both sides of the family. The answer to the question, is there any insanity in the family, is always, usually with emphasis and sometimes with indignation, no, but the wise physician does not put the question so bluntly. He does not directly interrogate about family matters. Instead he studies the father, and sometimes finds by observation and indirect questioning that he has some muscular-nervous trouble (a tic), that he is a little below par in intellect, that he is a sufferer from religiosity, or that he has had a mild attack of some trouble really mental, but called nervous, at an earlier time in his life. He may be a successful business man and yet, from the psychiatrist's point of view, be distinctly eccentric and show from his conversation that his outlook on life is far from normal. He occasionally is a faddist or a disciple of some cult. Sometimes he is an example of mild, aborted paranoia, a partly self-deceiving humbug. He may be a sufferer from uncontrollable temper or be extremely egotistic. Sometimes he is one of those semi-criminals who escape jail only because his position in life is such that there is no need for him to do the things which bring men into direct conflict with the law; he belongs to the class of "tricky" business or professional men. Whether the father pass this unsuspected examination successfully or not, the mother often proves to be, if she does not show some one or more of the abnormalities of the father, an hysteric, or a rather silly person, or a woman of ability, but with a mental twist spoiling her intellect and making it useless. Oftentimes an uncle is a pathological drunkard or a ne'er-do-well or perhaps an habitual criminal; an aunt has remained an old maid for psychological reasons, the men who met her in her younger days having unconsciously felt that she was not a girl to marry. More rarely definite parental insanity exists, and its rarity is not surprising because much more mental disease is carried over to the next generation by "borderland cases" than by the frankly insane, because many of the latter become impotent and others have no opportunity to procreate. It seems as if inherited qualities barely present in the parent may be greatly intensified in the offspring. Certainly, in the condition I am describing, one finds the lesser signs of abnormality in the parents and grandparents much more frequently than serious mental disease, but an entirely healthy ancestry is never found. The disbelievers in the influence of heredity are prone to become vexed and talk emotionally, or if they think themselves highly intellectual, to smile with a supercilious air, when told that things apparently trifling, if abnormal, are as important as great things, things which strike the eye of everyone; but the fact remains that seemingly slight abnormalities in parents are just as serious from the point of view of vitiation of stock as striking symptoms. Who thought, in the old days, that the boy's trick of making the leg jump by striking below the knee-cap was of any significance? But its cause once learned explained the physiology of tendon reflexes.

The history of the patient is always uneventful till puberty. Before that period he differs but little, if at all, from other boys. Though he may be above the average in ability to learn school lessons he never shows signs of genius and is never an imbecile even of the highest grade because the imbecile shows mental defect from the beginning of, or very early in, mental life. (The last stage does indeed clinically resemble imbecility.) He has before puberty neither more nor less of the sense of duty than other boys. In the school-boy world he is either a negligible factor or fairly popular and takes his own place, usually neither a high nor a low one. Physically he may be robust or delicate and may suffer all the infections of childhood or be immune to all. Gross physical disease, muscular strength or weakness and trauma play no part in causing his future downfall. When disease or trauma in childhood causes mental disorder later, it is of a different type than here presented and presents an unlike clinical picture. Parents hark back to a fall when a baby or a blow on the head when seeking for the cause and are sure an X-ray picture will reveal "pressure on the brain." Alas, there is not and never was "pressure."

Sometime during adolescence, it may be immediately after puberty or not till late in the teens or very early in the twenties, the boy's whole character, temperament and disposition change. The first thing noticed, if he be carefully observed by one skilled in studying the mind, is that he has lost or is losing, the power of concentration or fixation of attention. This is a different thing from the carelessness of the boy who will not bother to attend to lessons because he is more interested in play or that other boy, the real genius, who seems to lack power of attention because he is thinking his own thoughts. The home-made diagnosis is always laziness. If he is at school or college (the freshman year among college youths, in my experience, is the time of greatest frequency of onset), he begins to fail in his studies. This at first is regarded as being caused by carelessness, but really it is the result of his being unable to concentrate on his work. He usually at first and for months after, tries and tries hard, but do what he will, he cannot compel his mind to work, cannot make himself study. This is not because he is thinking of something else, not because he is interested in any play or sport, he cares for neither, but because he cannot think with concentration. Loss of the play instinct is quite as important as loss of ability to study or work. Its loss in any boy has dire significance. Later, it may be in a few weeks or not for several months, because the rapidity of progress of the disease varies greatly, he begins to show to the most unobservant loss of the zest for living, to lose all interest and to cease to take pleasure in anything. He is not melancholic but apathetic. If he is a working boy, one who previously has been industrious and ambitious, finding pleasure in his work, ever ready and quick, he now goes from job to job, never staying more than a week or two at any one place and always giving an inadequate excuse or reason for making a change. If he belongs to a family of larger worldly opportunity he drifts from position to position. He passes from a bank to a broker's office, a lawyer's chambers, a newspaper office, a business college, last, and this is to-day a favorite haven for the incompetent, a motor car agency. He at first tries each new position with an apparently strong determination to make good, but after a few days, or at most a few weeks, he is either discharged as incompetent or discharges himself. During all this time he is not vicious, not wilfully idle, his habits are not bad, indeed he is often morally correct. Sometimes he feels that his family do not understand him and have not given him a proper chance and this is the nearest to a delusion he ever approaches. He never has the acute feeling of persecution or distrust that sufferers from other types of adolescent dementia present in the earliest stage, nor does he, like them, ever become delusional. He never has any hallucinations or falsifications of memory. Soon he becomes markedly apathetic but not melancholic. He ceases to care to meet his young friends and becomes indifferent to all social life. Along with the rapidly increasing intellectual and emotional inertia there comes physical inertia. He becomes not somnolent but too inert to get out of bed till late in the morning. If he reads at all, it is only the lightest kind of fiction and soon he does not care even for that. After a rather indefinite period, varying from months to one or two years, during which time the symptoms may increase rapidly or slowly in intensity, one of three things happens. First, if he has no one to support and take care of him and retains his moral balance, he may drift into some position paying enough to keep him in a way, and requiring little mental power, or if he has means to support him he may drift through life, doing nothing either good or evil, save that in a negative way he is moral, eating, sleeping and never thinking, never taking any responsibility, being regarded by the people who know him as a very high-grade imbecile. The process of degeneration in this group ceases early and the victims remain mentally stationary, and live many years. Second, if there has been a weakening of the moral sense along with the intellectual degeneration, a thing which by no means always happens, he takes to drink and the things which go with it and soon becomes besotted, for these youths stand liquor badly. Death often follows in early manhood, usually from alcoholism. Third, if instead of a mere weakening of the moral sense there is a perversion, he becomes a petty criminal, not one of those who need and use cunning to carry out a crime but one of those who pick and steal without plan and without skill. His drinking has a different cause from that acting in the periodic drinker and alcohol does not produce in him the symptoms it does in certain men with mania or men in the early stage of paresis. He drinks because he has nothing to do.

The people described above rarely degenerate to such a degree as to be sent to hospitals for the insane though they are seen in county jails serving short terms. A few, as stated, retain enough mentality to do work of a kind and want to work, but many join the large army of the unfit made up, in addition to themselves, of the hypomaniacs, the imbeciles, the paranoids and the epileptics. They are found in the general population and if, among the poor they survive to middle life, they drift into the wards of almshouse hosiptals (where they are often mistaken for true imbeciles) sometimes with some serious physical disease, but often seizing the opportunity of some chronic but not really serious illness to get a home where they are as happy as the atrophy of their emotional instincts permits. Barring those who become drunkards, few develop into serious criminals though they often get into jail for misdemeanors: they rarely commit felonies.

Now, of course, non-medical men, and some physicians, diagnose this condition in its early stage as mere laziness, and strong believers in free will refuse to recognize it as a disease and are of the opinion that strenuous treatment, soon enough applied, would lead to cure. As a matter of fact, whether the will is free, whether there is such a thing as will in normal man or not, these men are not normal, have no will, and are congenitally diseased. We can only judge of will by conduct and it seems to the onlooker in slight, aborted cases as if the victim were making a willed struggle against disease, but in severe cases conduct is purely reflex, automatic, in immediate response to stimuli, and without any thought as to consequences. All attempts at cure by discipline, by change of environment, by education, fail utterly.

If seen for the first time after the disease is established, and in the absence of knowledge of the previous history of the case, the diagnosis usually made is imbecility. The point of difference is that the imbecile shows mental defect from the very beginning, or at least long before puberty, whereas the sufferers from this disease are, so far as appearances go, normal throughout childhood and for a time during adolescence. The condition differs from the other types of adolescent insanity in that there are no delusions, hallucinations, periods of maniacal excitement or melancholic depression, catatonic stupor, catalepsy, or hysterical convulsions. There are never the vasomotor symptoms seen in hebephrenia nor disturbances of the alimentary tract. It is a pure, slowly but steadily progressing dementia.

Though the father quoted above is often correct in suspecting his son is a frequent and habitual masturbator, he is in error in believing it to be the cause of the condition. It is an effect, a symptom. It, of course, increases both the physical and mental weakness and sometimes in the early stage does harm by creating impotent self-disgust. The normal boy learns self-control; these boys do not.

When we come to the question of etiology, we find much philosophic or unphilosophic speculation, but little knowledge. The same thing is true of all types of essential, developmental insanity, but not of those associated with gross organic affections of the susceptible brain. In the latter, the cause is always some poison, usually exogenous, acting on the cerebral cortex either by causing, first, disease of the bloodvessels, and only secondarily affecting the nerve cells, as may be the case in syphilitic insanity (paresis), though even in that disease some authorities hold the cortical cells are primarily affected or, as in puerperal insanity and indeed all insanities due to acute infectious fevers, there is a direct and immediate intoxication of the cells independent of any affection of the bloodvessel walls or connective tissue structures. In the insanity caused by an acute outburst of a chronic Bright's disease, there is probably present the immediate action of the poison on the cortical cells and the mechanical influence of thickened arteries and an overgrown connective tissue. Sometimes the poison is endogenous as in the dementia of cretinism and myxoedema. Paranoia is the great example of the insanity the cause of which is entirely unknown. It is doubtful, though, if paranoia is a disease in the common meaning of the word, rather it is an abnormality of the organ of mind (the brain), not caused, as in disease, by some external poison gaining entrance to and affecting the body, but by a congenital peculiarity of the germ plasm or sperm plasm. Certain it is that paranoiacs show no lesion anywhere in the body either macroscopic or microscopic and no symptom of any visceral disease which can in any way, even the remotest, be connected with the mental disorder. The paranoiac might almost be regarded as psychologically a distinct species of man rather than a diseased man.

To return to the simple dementia of adolescence: we are ignorant of its causation and it has no known morbid anatomy. As to the latter, however, it should never be forgotten that in mental disease the morbid anatomy only shows the localization of the disease, the disorder of function beginning before any visible lesion is produced. Further, the cause of the disorder does not arise within the brain, but elsewhere. The brain is simply acted upon. This is perfectly understandable in disease caused by poisons. We will discover the bodily origin of insanity not in the brain, save in hypothetical cases of abiotrophy of which I shall speak later, but in other organs.

The disciples of the newest psychiatric school explain the condition I am describing as arising from a conflict (sexual) of complexes taking place in the subconscious mind and hence regard the condition as psychic in origin. They do not explain it on the comprehensible theory that excessive masturbation causes permanent decay (confusing symptom with cause), nor do they admit that conscious distress about the inability to control a dirty habit may in a sensitive lad lead to mental breakdown. That is too simple for such profound thinkers. I must confess, though it is very old-fashioned to say so, very reactionary, and strong evidence of not having great intelligence, the newest explanation does not satisfy my type of mind. Persons of a theological mental bias are prone to confuse sin with disease and to agree with the father of the boy that he is just a wicked person. Many of us, however, are finding more and more that much of what is commonly regarded as sin is disease, and are compelled to think the simple dementia of adolescence just like the more complicated types, which the most virulently theological realize are pathological, is an example.

That there is a physical cause for it, *i. e.*, that there is either a defect in the cerebral apparatus itself or something which interferes with its proper working, there is no doubt; but what it is we do not know. I am inclined to think, and the same thought concerning developmental insanity in general has been held by others, that Gowers' explanation of certain muscular dystrophies, as being brought about by abiotrophy would explain it, or, at least, lead us one step further in explanation. Gowers assumed that normal cells have a certain capacity to withstand strain, *i. e.*, can do a certain amount of work; when that capacity is exhausted they cease to work. According to this theory, in certain people the cells of the muscular system have congenitally less capacity than normal and hence soon break down, the result being idiopathic muscular atrophy. Now this is hypothetically just as true or false of brain cells as of muscle cells. It may be that in the people we are studying, the higher cerebral cells, those having to do with mental processes, have a capacity to do their work during infancy and childhood, but are not able to perform the much greater, much more varied work, thrown on them at puberty and adolescence and hence cease to function even though they do not physically atrophy. Or they may be worn out even before the stress of adolescence comes. In the persons suffering from this disease there is not at the beginning perversion of function, such as occurs in most types of insanity before dementia comes on, but mere lessening of function down to a certain level after which there is a long stationary period, unless some outside, some exogenous, influence causes a total smashup. Assuming cells, the capacity for work of which is normal so far as character of work is concerned, but subnormal inasmuch as they are unable to do the normal amount, such cells would hypothetically simply cease to work or work poorly early in life rather than work perversely.

Another hypothesis, and it is somewhat allied to the first, because it may be the cause of the congenital cellular weakness, is that the chemistry of the body is at fault, either from some congenital defect or from some acquired disorder in the function of some one organ or group of organs. The fact that there is always some mental disturbance in the near forebears indicates congenital and hereditary defect rather than an acquired disorder. What the chemical fault is we, of course, do not know. The trend of thought to-day is to consider the endocrin glands, the so-called ductless glands, as having a much larger part in mental and emotional life than was suspected when their existence was discovered. That very ordinary chemical disturbances may affect the emotions and mental ability, has been known for ages by the influence that constipation has on many people and the gladdening effect of blue mass or calomel. The effect of castration of young boys on their mental and emotional character is well known. The ancients talked of the bilious and other temperaments. Certainly there must be a physical cause for the different types of normal people, a difference which affects not only intellectual power, but also the temperament. Whether a youth is to succumb or not to a developmental insanity depends on his inherent nature; if he succumbs, what symptoms he will present depends on temperament: one will dement quickly, another be paranoid, another chronically maniacal, another melancholy throughout life. Now it is very possible that mental capacity and attitude towards life depend upon the function of some one or other of the endocrin glands, and just as the pituitary gland controls bony development so some other gland may control the actual physical development of nerve cells and their ability to perform their functions. Or disorder in some of these same glands may cause such changes in the chemical processes in the human body as to produce a poisoning of certain cortical cells. All explanations of mental processes are purely hypothetical, but surely our future knowledge will depend more on the chemist than on the microscopist. The test tube will reveal more secrets than the microscopic section.

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THE BRAIN AND GENETIC FUNCTION.

By

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FROM numerous experimental observations on the relations between the central nervous system and the organs of procreation in different species of animals, I have repeatedly demonstrated that in the cerebrum, and more exactly in the cortex, there are centers which exercise a special influence on the function and on the less understood trophic processes of the sexual glands.

Spermatogenesis and ovogenesis take place under the continuous action of the higher centers which impart regulatory and inhibitory stimuli to the various evolutionary and indispensable processes for the perpetuation of the species.

These higher centers, acting as inhibitors of the great sympathetic and in relation with one another by means of central cortico-spinal paths, have no differentiated localizations but are diffuse throughout the cerebral cortex.

They have a homogeneous physiological action, so that only from their combined influence does perfect equilibrium of the genetic function result.

The main scope of this work being better to determine the value of this physiological action of the higher centers and to point out the great importance that they may acquire from the eugenic point of view in general, particularly the relations that they may have with more evoluted centers, it is best, so as to avoid useless repetition, to precede the new observations with a brief summary of the results of previous researches, emphasizing more especially those facts which have a more direct relation to the questions to be considered. Thus, in the first and second parts of the work I will summarize the results of researches following partial destructive lesions and the results obtained by purely dynamic lesions of the cerebrum. These results in most part have already been dealt with in previous publications. In the third part I will take up in greater detail the results of total destruction of the brain, finally considering the question of the psyche and procreative function.

Part I.

Effects of Partial Destructive Lesions of the Brain.

The existence of higher inhibitory centers was proved by me on the basis of the effects of re-percussion on the genital glands following partial destructive lesions of the brain (mutilation of a lobe or of a hemisphere in chickens and in pigeons), phenomena which acquire different and contrary characters depending upon the period which elapses between the trauma and the time of observation.

First, as an immediate result of the trauma, there are striking evidences of more or less severe involution in the whole or in the greater part of the male or female sexual glands. These changes occur rapidly and are often tumultuous in character. Regardless of the age of the animal, the effects are as a rule transitory. They are succeeded by anatomical and functional recuperation of the affected organ which apparently quickly regains all its normal characters. Only exceptionally, and then through possible complications that may follow the trauma, is this involution likely to become permanent. In such cases, as shown by Bertolini and Todde, there is an involvement of the lower centers in the degenerative process in addition to the changes in the general condition of the animal (arrest of development, cachexia, etc.).

Secondly, as a remote consequence of the trauma and as a symptom of the residual deficiency of the cerebral lesions which often appears also after a long period of sexual activity in apparently normal animals, the organs may show evidence of permanent and progressive involution possessing more properly the characters of an early exhaustion of the procreative powers of the species.

Such slow and progressive involution of the sexual organs is perhaps more easily demonstrable in the female than in the male.

In previous publications I have considered the histopathological aspects of the involutive and reparative processes in the testicles and in the ovaries of birds. I would only mention that in young fowls subjected to partial cerebral lesions and then allowed to grow, the periodic phase of their reproductive activity becomes lowered and notably deranged. In the first, and even more so in the second year following the operation the production of ova is reduced to less than half and even a third of the normal, notwithstanding that the animals grow and show nothing in their appearance or in their external sexual characters to distinguish them from the control animals.

In such cases the offspring, whether they be conceived between a traumatized hen and a healthy rooster or between a traumatized rooster and a healthy hen, suffer from deficiency of the cerebral genetic centers and attain maturity with difficulty. If maturity is attained they usually show deformities of various kinds and their life period is shorter than normal.

The effects of deficiency of the higher genetic centers on the descendants are still more marked when both parents are equally traumatized. Roosters subjected to extensive destruction of the cerebral cortex during the first six months of life, leaving intact, however, the mass of basal ganglia, show weakening and early exhaustion of the sexual power of the animals. They may grow up perfectly normal in appearance, but after a period of from one to three or four years of apparently normal sexual activity, they fall rapidly into a state of complete impotence and die soon afterwards. They die with symptoms of progressive cachexia resulting from a process of involution which affects the whole trophic equilibrium of the organism, comparable to that which is physiological in senility. It is to be noted that under normal conditions, at least in the breeds in our country, their sexual vigor remains almost unchanged until about the fifth year of life and longer.

Finally, these roosters, although their testicles maintain in appearance the characters of normal organs, almost always remain less adapted to the perpetuation of the species; so that although they can couple with normal hens their offspring frequently lack vitality and may show various anomalies of development.

These experiments may also be confirmed in pigeons.

I have thus demonstrated that in birds the insufficiency of the superior genetic centers reacts on the male and female reproductive organs and even more so on the development and vitality of the offspring.

In dogs the same observations have shown that the immediate reaction on the testicles, whatever be the part of the cortical zone traumatized, is always practically equal in character and severity. It is logical to admit, therefore, that the nervous centers in question are uniformly distributed through the cerebral cortex.

The immediate reaction of circumscribed cortical lesions on the sexual gland in the bitch confirms more fully the results already studied in birds. As a result of the trauma and independently of the general condition of the animal, the ovarian parenchyma shows changes of involution of an acute character and of diverse degree which may lead rapidly to a complete destruction of the follicles.

In bitches, as in hens and pigeons, the initial changes are usually in the cytoplasm and the chromatin elements of the germinal vesicle. It is always those follicles nearest maturity that are attacked. The younger follicles are generally spared. The process of involution is transitory and is succeeded by anatomical and functional reintegration which begins to take place about two months after the trauma. These animals completely recover their general condition during the first few days.

Part II.

Effects of Dynamic Lesions of the Brain.

In roosters, cerebral commotion is without effect. Repeated commotion, while temporarily depressing the sexual instinct and weakening the external sexual characters, causes in the testicles an atrophy which is proportional to the number and severity of the commotions. The signs of involution appear four or five days after the last commotion, attaining their maximum degree when the animal has completely recovered its other functions. This temporary involution of the organ is followed by reintegration which becomes complete thirty-five or forty days after the commotion.

In guinea pigs, it is only after numerous commotions repeated for fifteen or more consecutive days that limited and transitory traces of an involutive arrest of spermatogenesis can be observed; that is to say, there is a simple, functional torpidity of the testicles.

In dogs, slight commotion is without effect. Severe commotion usually produces a very marked involution of the testicles. The change is regressive and transitory, so that seventy-five or eighty days after the trauma there is a complete return of the organ to normal activity.

Usually in the first phases there is a total or partial arrest of spermatogenesis with the formation of *synapsis* between the seminal cells, diminution or absence of karyokinesis and, especially in the acute cases, necrobiosis of the mobile elements. Later there is other evidence of degeneration characterized mainly by the appearance of pseudo-giant cells brought about by the fusion of the more cellular elements, especially the spermatids in course of degeneration.

Sometimes in dogs a special functional deviation is met with, probably indicative of an abortive regeneration of the organ.

The question is one of true aberrant spermatogenesis in which mainly the daughter cells, and more especially the spermatocytes in prophase and in metaphase, take part; so that atypical elements are intermixed with normal elements.

The chromosomes become thick and transformed into small, round masses and finally assume the form of a nemasperm head. Subsequently they become disposed in a free state by a process of disintegration which takes place in the cellular protoplasm.

These chromatin corpuscles represent aberrant nemasperms in which the spermatozoon is represented by the head only. This atypical biological process may be present in the second month after the trauma and is entirely independent of the general condition of the animal which, indeed, may be excellent in every respect.

These observations lead to the conclusion that the higher inhibitory centers, intermingled with the motor and sensory centers (which may also suffer deleterious effects provoked by simple dynamic disturbances) are endowed with an exceptional sensitiveness towards disturbances of their functional equilibrium.

De Lisi's investigations prove the absence of any causal connection between the severity of the involutive phenomena in the generative organs of the animals subjected to cerebral commotion ,and the conditions of the cortical centers. They point out the main functional derangements characterizing cerebral commotion but an adequate agreement in the anatomical manifestations, as revealed by histological means, is not discoverable. Secondly, De Lisi's investigations on the superior centers show but slight anatomic traces of them, or such are absent entirely, whereas the cellular changes and degenerations in the mesencephalon, myelencephalon and in the spinal medulla are numerous and usually quite striking.

The results of my observations on cerebral commotion demonstrate, therefore, that the value of the inhibitory centers in question varies considerably from species to species and is in direct proportion to the evolution of the series.

I am calling attention to these facts, which I have already confirmed in man, because of the not inconsiderable importance that they assume, as we shall see later on, in the eugenic questions of daily sexual life.

Part III.

Effects of Total Destruction and Decortication of the Brain.

After what has been stated about the effects obtained on the procreative organs by partial destructive lesions producing purely dynamic disturbances of the brain, it is necessary now to consider the effects of complete destruction of the brain.

The presence of centers throughout the cerebral cortex endowed with a trophodynamic action on the genital organs must be admitted. It will be necessary to study more closely their limits and functional characters and to compare them with the respective inferior centers situated in the spinal medulla and endowed, as we will see, with a purely trophic action.

It has already been mentioned how the relations between the brain and the organs of reproduction vary considerably from species to species, being in direct proportion to the degree of evolution of the species.

In guinea pigs this relation may be regarded as almost *nil*. It is present in the pigeon and in the rooster and is much more evident in the dog and in man.

An extensive series of experiments on turtles carried out in my institute by Dr. De Lisi has shown that total decerebration in these animals has not the slightest immediate or remote effect on the trophism and function of the male or female sexual glands. In turtles, therefore, the presence of higher genetic centres may be excluded. Dr. De Lisi will in due time report on the details and interpretation of these investigations. It will suffice for me to point out that in these lower animals there exists an absolute independence between the brain and sexual organs, the functions of which seem to be regulated exclusively by the inferior centers.

I will now briefly consider the results of my researches along the same lines partly on birds (pigeons and chickens) and partly on higher mammals (dogs).

My former investigations have shown that in birds the effects of decortication correspond to those of cerebral mutilization, bearing in mind that ordinarily in the actual experiment it is not an easy matter in these animals, in the removal of the anterior brain, to limit the lesion to the cortical portion of the organ.

In dogs I could confine myself to the destruction of the cerebral cortex, confirming my previous experiments which showed that the brain could be considered the fundamental seat, though not the only seat, of the higher centers in question.

Three pigeons were operated upon: two males and one female. For the first fifteen days after the decerebration the animals wasted away, but through good feeding they rapidly improved and soon regained their original weight. One of the male pigeons was killed after sixty-four days, the other after six months; the female was killed after five months.

No cock or hen was observed for a long period after complete decerebration. But such as were subjected to total scarification of the cortex of both hemispheres were observed. As described in my article on "*L'influenza dei Centri Corticali sui Fenomeni della Generazione e Perpetuazione delle Specie,*" these animals retain almost unchanged their sexual instinct as well as their sexual organs and after the traumatic *shock* they quickly recover their normal characters, although they show themselves almost entirely incapable of reproduction.

Two dogs, a male and female, were kept under observation after complete destruction of their cerebrum by means of a surgical spoon. During the first thirty or forty days they each wasted away considerably, but by forced feeding they each gained two kilograms in the latter months of their lives. Their power of locomotion improved rapidly so that while unable to support themselves during the first few days, after a month they were able to walk, but rather unsteadily. Their tactile sense was dulled; the sense of taste was not impaired, hearing was impaired and vision was lost. Their intelligence was considerably lowered and they were indifferent either to menaces or caresses. On the other hand, their sense of hunger was not impaired, as they would be restless and snarling when hungry. But, of course, as they were unable to find their own food they would have died of inanition, like the decerebrated dog of Goltz, were not the food brought right up to their muzzles. Neither the male nor the female showed any sexual desire. The former was killed after six months; the latter after seven months. At autopsy, great destruction of the cortex of both hemispheres was found, but the basal ganglia were apparently normal. The effects observed in these animals are, therefore, to be attributed entirely to the destruction of the cerebral cortex.

Let us summarize briefly the findings in the sexual glands of the decerebrated pigeons and the decorticated dogs:

Of the two male pigeons the first, killed sixty-four days after decerebration, showed the testicles very reduced in size, although nearly normal in structure. They were composed of epithelial cells, a moderate number of them in mitosis, and like these organs in course of regeneration, some spermatozoa were also present. The so-called interstitial glandular elements were practically normal.

The second male pigeon, killed six months after decerebration showed, on the contrary, the testicles of considerable size, corresponding to normal organs in a state of activity. Upon microscopic examination they proved to be in full functional activity, the numerous mobile elements having the characters of typical and flourishing spermatogenesis. The interstitial glandular elements were in perfectly normal condition.

These decerebrated pigeons, contrary to those killed by Schrader four months after operation, showed no sign when in the presence of the female, either in their cooing or in their characteristic movements, of any sexual excitation. Analogous findings were also obtained in completely decerebrated doves that were killed while in best general condition a month and a half after operation.

The ovaries appeared in a state of regular ovulation and contained quite a few well developed ovules. The small ovules, as well as the larger ones, had in great part a normal structure. It showed that even the female sexual glands are able to undergo a certain anatomical and functional reintegration independently of the presence of the superior genetic centers.

Furthermore, in these doves which gave no evidence of sexual excitement and always remained indifferent in the presence of the normal male, the interstitial cells were normal.

From these observations on totally decerebrated pigeons it may be deduced that the sexual glands, male and female, can continue to functionate apparently regularly without the superior genetic centers.

In confirmation of this the results obtained in chickens merit recording. A rooster and a hen, in which about a quarter of the whole anterior brain and the posterior half of a cerebral hemisphere had been removed, were kept under observation for more than a year. During this period they were in the best general condition. The rooster which after three months had again become potent, was killed twelve months after the cerebral operation. The testicles were almost normal in size and in active spermatogenesis. The hen, which had laid one egg in the year following the operation, was killed in the spring of the second year. The ovaries showed many large ovules nearing maturity.

Similar results were obtained in the dog and the bitch that had been completely decorticated and killed after six and seven months respectively. The testicles of the former were perfectly normal macroscopically and microscopically and in vigorous spermatogenesis. The endocrine elements were abundant and normal. The ovaries of the latter possessed all the characters of organs in activity and contained a moderate number of normal ovules in diverse degrees of evolution, some of them nearing maturity. The interstitial elements were in normal condition.

If we try to verify the results of the preceding experiments on the relations between the brain and the male and female sexual glands, and especially of the rapid and transitory phenomena of involution occurring in these glands following cerebral lesions, we must logically interpret the latter as a direct consequence of such a process of rapid reintegration which always follows partial organic lesions as well as primary dynamic disturbances of the brain. We have direct proof of this in the case of the pigeon killed 64 days after total decerebration in which the testicles showed all the evidence of a reparative process.

We must conclude, therefore, that in the higher beings (birds and mammals) the presence of the superior genetic centers is not necessarily indispensable for the processes of anatomic and functional restoration of the genital organs and that the trophic and functional property of these organs possesses an unquestionable autonomy in respect to these centers.

As seen in the turtle, there is not, however, an absolute independence between the brain and peripheral organs. It is only gradually that the relations between the brain and the genital glands increase and become more noticeable.

In the higher animals we can only speak of a relative autonomy. Proof of this is to be found in the numerous facts already pointed out—phenomena of residual deficiency following partial lesions of the brain which tend to show that without the complete and constant stimulus from the superior genetic centers to the inferior centers by means of the central sympathetic cortico-spinal paths, the latter lose more or less quickly that equilibrium which is necessary for their normal function so that under such conditions the sexual glands tend to lose their procreative property, their metabolic processes always becoming more torpid and incomplete and easily exhausted.

This condition of hypo-activity of the epithelial elements may be followed by a hyperactivity of the connective tissue elements so that in such a case the outcome may be a sclerotic process and the trophic disturbances may attain such a degree as to render a reintegration of the organ impossible.

In this connection may be mentioned also De Lisi's recent experiments on the effects of coffee and of veronal, in addition to cerebral commotion, on the testicles of the rooster for the purpose of determining if the phenomena of involution are more striking than usual and to bring about a more abnormal proliferation of the intercanalicular connective tissue. All that was found in these cases was that the combined action of the cerebral trauma and the nerve toxins affected not only the superior centers but also the inferior centers producing complications analogous to those which may follow cerebral lesions alone.

To the whole intricate question regarding the system of centers and regulatory paths of the sympathetic it may be objected that the sexual glands, like the endocrine glands in general, are capable of functioning independently of their nervous connections and perhaps without the need also of a nerve impulse. The fact has been proved by many experimenters that these glands may be transplanted to some other part of the body and that they will continue to grow and functionate.

I was able to obtain nineteen grafts of the testicles of a capon—some on various parts of the intestinal wall, some on the capsule of the liver and some on the mesentery.

After nine months all these grafts were still functionating; the capon became a cock in the true sense of the word, lacking only the ability to procreate.

Histological examination of the grafts showed in all of them normal testicular structure in full spermatogenesis. From this experiment as well as from other similar experiments, it would clearly appear that the internal secretion as well as the external, are conserved in the transplanted sexual gland. I do not believe, however, that the independence of this organ from the nervous system can thus be concluded. "When the graft becomes attached," justly writes Pende in his work on "Endocrinology," "it undoubtedly comes into nervous relation as well as vascular relation with the rest of the organism; the graft does not functionate outside the control of the nerves."

Probably it is the sympathetic nerves accompanying the blood vessels that form the trophic nerve paths of the graft as many are inclined to admit for the endocrine glands even in normal conditions.

From experiments with transplants it may be deduced that the sympathetic paths and perhaps also the inferior centers presiding over the trophism of the tissues are polyvalent, in the sense that they can supply organs and tissues of diverse nature. But the superior centers have a more specific and individual function.

It is hard to explain how a transplant of the testicle could attach itself indifferently to the most diverse parts of the animal, as in our experiment already cited.

From these experiments the importance that the superior genetic centers assume in the higher species becomes clear. It is to be interpreted not in the sense of general trophism, but solely as a complex and higher function which serves to regulate the specific metabolic processes subordinated to the laws of procreation in general rather than to the common trophism of the tissues.

The value of the action of these superior centers on the organs of procreation cannot be ignored and it may be said that *to these centers are reserved not only the inhibition in general of the sexual glands, but in particular the regulation of all the physiological laws outside ordinary trophism around which the mystery of procreation revolves: the periodicity of the various phenomena in the sexual sphere; the procreative potentiality of the individual representing the species; all the proccsses through which the seminal elements and the ovules pass in their multiplication and evolution towards maturity, the power of reproduction, fecundation and perpetuation of the species.*

As I have concluded, the superior genetic centers have only a visceral inhibitory function. The various phenomena can be interpreted only as a simple visceral shock. This brings up the question of functional arrest of the bulbo-spinal centers either by direct lesions of the inhibitory centers or by violent excitation similar to motor paralysis and intestinal and cardiac paralysis caused by strong emotion, fright, etc. Foster has shown that cerebral shock depends in general upon the sudden suppression of bulbo-spinal reflexes. Consequently the phenomena of functional arrest will disappear as the inferior centers adapt themselves to the new conditions, that is to say, learning to functionate independently. Whatever be the interpretation given to this visceral shock, it constitutes the more direct proof of the intimate functional relations between the brain and the genital organs.

Psychic Influence on Generative Power.

Having demonstrated the cortical situation and the inhibitory functional value of the superior genetic centers we come now to the question of their correlation with still higher centers and of their importance in the interpretation of phenomena of the psychic influence on spermatogenesis.

The fact that the phenomena of *shock* of the genital organs correspond to that observed in other visceral organs indicates an intimate and reciprocal correlation between the superior centers and the psychic centers.

The influence of psychic causes, such as the emotions and conditions of nervous exhaustion, on various visceral functions provides an indirect demonstration of the relations between the visceral centers and psychic centers. From the disastrous effects that psychic causes may have on the organs of procreation and especially on their cellular metabolism, we can deduce that the correlation between the visceral centers and the psychic centers with regard to these organs is more intimate and direct than with the other viscera.

In the sexual glands it is not merely a simple phenomenon of shock limited to an abatement of transitory functional arrest of the organs which in a brief period of a few hours or a few days regain their normal equilibrium. It is essentially a question of grave functional and trophic disturbances which may be protracted for weeks or months; which may, perhaps, leave a deleterious impression on the progeny. If the disturbances are not permanent they may persist for a long indeterminate period when the equilibrium of the other viscera and the entire organism has already become completely re-established.

These prolonged effects from the shock were proved by me experimentally on animals and in man, by means of cerebral commotion which was shown, independently of any organic lesions of the brain, to be capable of causing not only weakening and arrest of spermatogenesis, but also true and peculiar aberrations of spermatogenesis for a period of two or three months after the trauma while the general condition of the animals returned very rapidly, as a rule, to their former condition and appeared excellent in every way.

As the deleterious results of psychic origin are not very dissimilar from those of physical cerebral trauma either in degree, nature or duration, it is a question in such cases of functional and trophic disturbances of the procreative organs, male and female. The experiments have shown that psychic influence, analogous to the effects of cerebral commotion, may affect the ovaries with disturbance of their function and trophism and with the causation of dynamic arrest and involution of the follicles. Especially those follicles nearest maturity are always the first to suffer the ill effects.

In the male psychic disturbances may have effects on the sexual apparatus no less disastrous than in woman. Spermatogenesis may be disturbed in various degree—from a simple weakening or retardation to a complete arrest. Psychic disturbances in man not only may diminish more or less, or arrest the spermatogenetic processes, but they may induce deviations, functional aberrations which undoubtedly may react disastrously on the offspring.

These conclusions, based on experimental observations, pointing out the enormous importance that the psychic factor may possess in eugenics, find their application and confirmation in daily practical observations. Suffice to mention the condition of perhaps very prolonged transitory sterility in man following mental overwork and cerebral exhaustion. It shows the intimate relations between *psyche* and the phenomena of procreation. But of even better demonstration are the unfortunate results caused by intense emotion: psychic causes of prime importance as proved by the disastrous results following earthquakes, wars and states of siege. The results of the experimental researches explain every-day empirical observations. We would call the attention of eugenists in particular to the value of these in the tragic moment through which we are passing and they may well ask themselves whether the human race is more threatened by the storm of extermination of the present fury or by the pain and suffering of the spirit.

What is the physio-pathological mechanism by which psychical influences can so easily be reflected on the descendents?

The interpretation given by Lange and James on the mode of action of the emotions and psychic influences as degenerative causes consists of a reciprocal repercussion of disfunction between the more diverse organs and the brain following vasomotor, secretory, respiratory, digestive, etc., disturbances from which there may be a state of auto-intoxication causing a deleterious reaction on the chemistry of the germinative cells. Curious and incomprehensible is such a plurivisceral theory which holds that the anarchical action of the whole organism can, under a disturbed and altered nervous function, create a specific deficiency in the organs of procreation. It has been shown that in adult animals not even in the suppression of a single internal secretory gland, including the thyroid which may be in closer correlation with the genital glands, can such a severity of phenomena be attained as with simple cerebral commotion.

The presence of inhibitory genetic centers in the brain and their intimate relations with the psychic centers being conceded, it will not be difficult to imagine the deleterious action of psychic trauma on the genital apparatus. It will not be a question of auto-intoxication, but of simple depressive processes inhibiting and arresting a glandular function, that is to say, a true visceral *shock*.

All this applies not only to intense and sudden emotion but also to prolonged emotional conditions, to conditions of anguish and pain, etc. The pathogenetic mechanism in these cases will always be the same, along general lines, with the only variation that, instead of a complete suspension of spermatogenesis, there may be disturbances and functional perversions of diverse grade and nature in the sexual organs. The disastrous effects on the offspring will certainly not be any less than in sudden and transitory emotion.

The results of the researches on the relations between the brain and the genital organs tend to prove not only the importance which the cerebral genetic centers have on those of the medulla but also to explain the close correlation between the metabolic processes of the genital organs and the psychic processes.

The significance of this psycho-genetic correlation in the social sphere surpasses our imagination, for not only do the instantaneous emotions and the prolonged emotional states act on the human *psyche*, but also a thousand other factors which arise from individual tendencies, from society and from everything that forms the source of psychic life.

Without entering into the question of specific psychogenetic reactions and to the harmful influences peculiar to diseased mental conditions, I do not believe that a eugenic value can be denied to the psychic potentiality of an individual. That the deficient as well as the exuberant mentality has a direct and important bearing on the hereditary biological processes cannot be ignored. In fact, the activity of the inhibitory genetic centers is subordinated to a psychic element and every variation in this stimulus which tends to derange it from the normal state constituting the *optimum* for the functional equilibrium of the organs of procreation may react on the latter as a degenerative factor depending upon the degree of variation in the stimulus.

These variations in the psychogenic stimulus may comprise either a deficiency or an augmentation. We must regard the deficiency and the exuberance in the psychic faculty as the same in their effects on the progeny and assign to them equally a negative value in the eugenetic power of an individual. In the case of psychic deficiency the individual may become incapable of reproduction because of insufficiency of stimulus, as in nervous exhaustion. In the case of exuberance of mentality the higher energy participating in the visecral functions, passing from the subconscious to the conscious and engaged in higher work, tends to damage the genetic centers, making them unable to discharge their natural function.

The eugenetic power of the higher intellectual men will thus be inferior to that of the ordinary man. The frequent sterility of the great, for example Kant, Newton, Pitt, Fontanelle, Beethoven, Michael Angelo and Leonardo da Vinci, is more evident proof that genius in reality constitutes a negative eugenetic quality, capable of creating a *deficit* in the hereditary biological processes. The same is true of intellectual woman who usually are sterile or have few children.

This does not confirm Lombroso's view on the relations between genius and insanity because the genius is only through exuberance of a natural human power strictly subordinated to the organic perfection of his brain who may become incapable of procreation. The defective, the degenerate and the insane become unprocreative by defect of the mental faculty which defect is bound up with congenital or acquired abnormal conditions in the brain—always pathological in the true sense of the word.

The value of these two degenerative causes will vary naturally in different individuals, first of all because of their nature which permits through infinite variations more or less in degree, the removal from the optimum of psychic development which constitutes the ideal for the reproduction and perpetuation of the race. Secondly, the effects will vary in degree from individual to individual with the same fundamental spychic cause, whether it be the basis of deficiency or the basis of exuberance of the stimulus.

In the case of psychic deficiency the results can only be marked and of constant character by participation of the visceral centers because it is hardly likely that the involutive or morbid processes which are the prime and direct cause of this deficiency can spare the superior genetic centers which, as we have seen, are diffused throughout the cerebral cortex. We must admit that presumably there are two primary factors acting contemporaneously on the hereditary biological processes: insufficiency of the stimulus and insufficiency of genetic inhibition.

On the other hand, in the case of exuberance of psychic activity, the deleterious effects may be relatively less grave since it is logical to suppose that these will be produced only by the excess of stimulus.

This reaction of the cerebral genetic centers to excess of psychic stimulus in each individual, but varying with the sexual constitution of the individual, should have an important bearing also on the ultimate effects of the degenerative cause. Summing up the whole question then, the variations acting against this degenerative factor—determined by the state of major or minor psychic tension of the moment—will have corresponding variations in the effects. We see, therefore, that instability constitutes the principal characteristic of the degenerative cause created by excess of psychic stimulus; whereas in the case of psychic deficiency the degenerative cause acquires a special characteristic of invariability.

The phenomena of individual variation of the sexual functions subordinated to various states of psychic activity is not new and it is to be noted that abuse of the mind can be the cause of temporary impotence in individuals of undoubted sexuality. The psychic constitution, the influence of which on the sexual impulse may be enormous, varies markedly from individual to individual. While this impulse may be easily exhausted in defectives and in idiots, in individuals of higher intellectuality it may vary and be present in two opposite extremes: Goethe, Napoleon, Liszt, Wagner, Rossini and Bellini were erotics; Schopenhauer, Tolstoi and Weininger clearly proclaimed their sexuality although repudiating some manifestations of it; Kant and Nietzsche were frigid.

The excess of psychic stimulus, therefore, can act either as an excitant or as a depressant because the individual resistance to the psycho-sexual reactions can be diverse and opposite.

However, whether it be in higher beings or in man, the brain represents the organ which assumes the more important directive part in all the functions of procreation. Its myriads of cells and fibers possess the necessary means for producing a reinforcement or an inhibition of these processes, either instinctive or visceral, and capable of governing the intimate conflicts between the diverse energies in the supreme interest of the species.

Thus the brain as a regulatory organ in the great mystery of procreation acquires a new place in physiology, in the vast field of the subconscious. It is as if to say that nature has provided a means to assure the procreative power of man, entrusting to it his superior energies, the sole capacity of conserving, subconsciously, the equilibrium compatible with natural exigencies.

Subjecting this faculty to psychic conditions of man has placed a limit not only to the danger of an excessive reproduction of weak offspring not adapted to life but it places a block on the strong and victorious.

Summary and Conclusions.—The biological processes constituting the phenomena of procreation are subordinated to nervous influences, represented by a very variable physiologic system in different species of vertebrates which becomes more complex and perfected as we ascend the series.

In inferior vertebrates the metabolism and the function of the genetic organs are exclusively regulated by spinal centers which exercise a trophic and inhibitory action at the same time. In higher vertebrates the spinal centers come under the action of higher more differentiated centers, of cerebral centers which participate in the genetic function.

The spinal medulla does not suffice for the phenomena of reproduction. The participation of the brain is necessary, which, always in intimate and sympathetic correlation, assumes the direction of the trophic processes and of the more mysterious functions of the organs of procreation by means of which a being is able to reproduce his like, that is, to perpetuate himself.

In these cases the spinal centers retain only the trophic function in the ordinary sense of the word, which, at least for a definite period of time, may discharge their impulses in apparently normal manner without the intervention of the brain.

In this division of work the medulla in its phylogenesis loses its primitive importance and appears in higher, more evoluted animals, as the intermediary station between the brain and the sexual organs.

The superior genetic centers which functionate as inhibitory centers are disseminated through the whole surface of the cerebral cortex and act under the direct stimulus of psychic energy. They assume an essential importance in man and can by defect or by excess act as a true degenerative cause conducing to sterility.

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ON THE STUDY OF THE QUESTION OF SEX.

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WHEN we come to regard it in its broadest sense, the study and investigation of the matter of sex is many times by far the most important field of research in the entire range of science. Sexual science as a whole is one to which the minds of untold thousands of writers and thinkers have been given since the very dawn of history, a science that can boast of an enormous literature, an extraordinary history, and yet, at the same time, is a subject, even in some of its simplest details and facts, the general reader and the public know and understand the very least about. Indeed, it has been this nearly universal lack of common knowledge of sexual information which has been responsible for the greatest amount of human unhappiness; the destruction of unnumbered millions of homes; the general nonprogressiveness of the race; the chief factor in the perpetuation of crime, and various other evils and drawbacks too numerous to enumerate here. In order to intelligently study such a question as the question of sex, and to comprehend even a small part of much that it enters into in life upon the earth, one should possess not only a very wide knowledge of general biology, but, in addition thereto, should be especially well-informed in the sciences of psychiatry, psychology, medicine, law and criminology, ethnology, anthropology, folk-lore and religion, as well as the anatomy and physiology of all living forms, and to a large extent sociology. Sexual science offers us for investigation not only its normal aspects, but its pathological side as well. It is not only accountable for the continuance of life upon the globe, but is the foundation of a great variety of animal attributes, as love, hate, fear, jealousy with allied emotions, and the multitudinous consequences arising from their action and interaction. Where the normal instincts and dictates of sex are met in their fullest demands, there alone can true happiness reign, and conversely, where the reverse of all this obtains, there do we find only misery and death associated with all that is unnatural and criminal leading to such results. With living forms in time not only have the sexual organs and their functions had their evolution, and in many cases their degeneration, but likewise has there been an evolution, or in some instances, a depreciation, of sexual attributes. Various perversions of the sexual instincts, and there are many of them, both congenital and acquired, are far less apt to be met with among the lower organizations of life than in the higher groups, and especially in the case of man. Frequently, however, these departures from the normal in all sexual manifestations may be traced from where they occur among the higher groups to their origin or origins among the more simply organized animals. Somewhat similar exemplifications are met with among some of the representatives of the vegetable kingdom, that is, where an evolution of sexual organs can be traced.

Were we to describe and illustrate all there is to be known having anything to do with the science of sex in living and extinct forms, both animal and vegetable, a library of many thousands of volumes would be the result. No single individual could pretend to compass it in twenty lifetimes; it would require an army of trained scientists laboring throughout an entire epoch of history, or even more. Therefore, from the viewpoint of the biologist, the study of the science of sex can, from the very nature of the case, be pursued only along certain lines. He must necessarily be a great reader, not only of the subject as a whole, but in particular of the works of the masters in the matter of organic and general evolution, as those of Darwin, Wallace, Huxley, Weismann and not a few other eminent expounders. He must be an accurate observer. And, finally, as far as circumstances will permit, he must be a student of the actual material illustrative of the science. This last entails researches in both private and public laboratories, in the museums and in the field. From all this, common observation alone will convince him that there will be no difficulty in the distinction of sex in his own species, that is, where the subjects are normal and nude. Apart from other characters the genitalia are sufficient to establish this much. This holds true for the Class Mammalia in general, except in the case of the *Monotremata*, as, for example, in the Duck-Bill and Spiny Anteaters—egg-laying mammals—where a special knowledge of the anatomy of the genital system will be required to distinguish the sexes. From mammals the biological student of sex passes to the Class Birds, and here he meets with problems of greater difficulty. There is, however, a very vast literature to assist him in the determination of sex, while the collections in the museums and observations in the field will materially assist him. The plumage of some species of birds is the same in the two sexes and there may be no seasonal changes. Here sex may be determined only by actual dissection. Again, the plumage and other characters may be the same at all times of the year in the two sexes; the female is invariably larger than the male, so that when specimens of both sexes, fully adult, are submitted to one, the question of size would settle it. This is the case with many snipes and their allies; with many hawks, falcons, owls and their near kin, and other birds. Often the plumage of the male is entirely different from that of the female of the same species, and remains so throughout the life of the individual, or it may occur only during certain seasons. Ornithologists of every age have made studies of these changes, and many such observations are being made at the present time.

"It is among birds," says Geddes and Thomson, "however, that the organic apparatus of courtship is most elaborate. The males very generally excel in brighter colors and ornaments. Beautiful plumes, elongated feathers, tresses, brightly-colored combs and wattles, top-knots, and curious markings, occur with marvelous richness of variety. These are frequently displayed by their proud possessors before the eyes of their desired mates, with mingled emotions of eager love and pompous vanity; or it may be to the subtler charms of music that the wooers mainly trust. During the breeding season, the males are jealously excited and pugnacious, while some have special weapons for dealing directly with their rivals. The differences between the magnificent male birds-of-paradise and their sober mates, between the peacock with his hundred eyes and the plain pea-hen, between the musical powers of male and female songsters, are very familiar facts. Or again, the combs and "gills" of cocks, the "wattles" of turkey-cocks, the immense top-knot of the male umbrella-bird (*Cephalopterus ornatus*), the throat-pouch of the bustard, illustrate another series of secondary sexual characters. The spurs of cocks and allied birds are the most familiar illustrations of weapons used by the males in fighting rivals. As in other animals, it is important to note that male birds often acquire their special secondary characters, such as color, markings and special forms of feathers, only as they approach sexual maturity, and sometimes retain them in all their glory only during the breeding season."*

So different in appearance are the two sexes in certain birds that originally they have been described by ornithologists as distinct species, and it has not been until long afterwards, when fuller information has come to hand, that the error, or such errors, have been discovered and corrected. The *huia* birds of New Zealand afford good examples as illustrative of this point.**

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*Patrick Geddes and J. Arthur Thomson: The Evolution of Sex. New York, 1890, p. 6.

**Shufeldt, R. W.: Some of the "Outliers" Among Birds. *Pop. Sci. Monthly*, Vol. XLVI, No. 6. New York, April, 1895, pp. 777, 778, Fig. 9.

What has just been described as obtaining among birds is equally applicable in the case of reptiles, amphibians, fishes and any number of insect groups and species. Sometimes it is quite impossible to distinguish the sexes without resorting to anatomical dissection. This is the case with nearly all snakes, many turtles and tortoises, and other forms. As with birds, the males, especially during the breeding season, may develop certain colors, or accessory parts, or have certain scent glands excited to unusual activity and other changes. There are simply untold thousands of beautiful instances of sexual differences and variations among all the groups of existing animals and plants, and there is no question but what the same held true for many forms now utterly extinct, while in an endless number of others the sexes could not be, upon superficial examination, distinguished.

Over and over again among all existing groups, in a great number of families, zoölogists have described the male and the female of the same species as the male and the female of two different species, and doubtless such errors will be made in the future. Such mistakes are usually made when describing faunal collections made in little explored countries, where the habits of the animals are more or less unknown, and, as often happens, only a few specimens were collected. These may have been all of one sex, either male or female, and the unobtained one not discovered until long afterward. Such errors as these, however, are now less and less likely to occur, and their commission has nothing whatever to do with the question of the determination of sex *per se*. Where male, female or neuter characters actually exist the skilled morphologist, especially if aided by the microscope and other scientific appliances, can in these times readily make such determinations, and our knowledge of such subjects has been enormously increased during the last half century.

It was largely through the study of sexual characters and their significance in existing animals and plants, taken in connection with the whole question of reproduction and propagation, that the law of organic evolution was in its main manifestations eventually demonstrated through the labors of many observers, minds and pens. As every reader now knows, Darwin did not stand alone in expounding the main factors of that great law primarily based in our knowledge of structure and habit of organisms, sexual selection and various allied questions. Nevertheless, as we know, he was the chief contributor to the result that followed upon the appearance of his numerous works. Many other master minds helped to build up the structure, but all this is now everyday history and need not detain us here, though it may be said in passing that, while the great living authorities may seem to differ in their opinions in regard to the law of evolution, it is to be observed that, with respect to its main or essential factors, the unanimity of opinion among them is without exception. Again, to be a thoroughly successful student of the science of sex and the enormous field it covers, one must not only have studied the works of such writers as Darwin, Wallace, Huxley, Spencer, Weismann, and many of their expounders, but it is equally necessary to have had a long laboratory experience and abundant opportunities fully availed of, to study the sexual system of the various animal forms and of plants throughout nature. It is quite impossible to comprehend all that the science of sex has to offer in man, unless one be familiar with the law of evolution and development, and what the question of sex signifies throughout all living forms. So comprehensive is this subject that it can hardly be more than lightly touched upon in the present article. Indeed, the student should systematically read not only the best of the works of the comparatively earlier authorities, but the most recent productions on the same subject by many excellent writers since the times of Darwin, Huxley, Cope and others. It can only be through such reading and incessant observation that one can gain any adequate idea of what is meant by primary and secondary sexual characters; or the great mass of facts that Darwin marshalled to throw light upon the question of *sexual selection*, by means of which specific variations were preserved and perfected, which variations were either of decided value to the males in developing their means of defeating their rivals in contests for the females, or rendering them more attractive and successful in courtship.

On the other hand, *natural selection*, advocated by Wallace and his school, is quite an opposite hypothesis wherein it was held that the differences to be seen in the *females* of the majority of animals in nature, in that they are weaker, smaller and generally of more sombre colors than their mates, was primarily due to the subordination of their characters to meet the ends of what was demanded on the part of protection from their enemies, the protection being due to the fact that they were thus rendered less conspicuous, and concealment was thus assured with far greater certainty. Other eminent students of the subject, such as Brooks, contend that the power to transmit variations among all animals as a rule, predominates in the males and they are consequently more divergent.*

It would seem to be generally true in nature that not only is it the tendency of the males to be larger than the females in most all species, but the former as a rule live longer. Again, the males are generally more active, combative, keener, and have the sexual instinct decidedly more pronounced; while on the other hand the females are passive, less passionate, as a rule, and exhibit other well-known characters pertaining essentially to their sex.

The sexual constitution in both males and females may be profoundly influenced through various causes acting in a great variety of ways. Among these stand many mutilations of the organs of generation in either sex, as castration in the male, and the removal of the ovaries or other parts in the female. This constitutes a very wide field for research. The effect of *nutrition* and *environment* are other potent factors in influencing the physiology of the sexual constitution in living forms. In studying all relating to this question in sexual science, it becomes necessary to consider such knowledge as we have gained of *metabolism*, and especially with its reference to the sexual system. Biologically, metabolism has been defined as the "sum of the chemical changes within the body, or within any single cell of the body, by which the protoplasm is either renewed or changed to perform special functions, or else disorganized and prepared for excretion." These two processes are ever in operation and ever present throughout all nature and living forms. We then recognize the *nutritive* function as well as the *reproductive* function—the former, metabolism, resolving into *anabolic* and *catabolic* processes, the latter, *reproduction*, from which spring the physiological activities of the male and female sex. Taken together, the combined functions represent the manifestations of the sum total of what constitutes life, and the perpetuation of life.

As a rule, males in their constitution are said to be more catabolic (catabolism), and the females the reverse, or in them anabolic processes predominate (anabolism). An authority at hand puts it thus, "the males live at a loss, are more *catabolic*, disruptive changes tending to preponderate in the sum of changes in their living matter or protoplasm. The females, on the other hand, live at a profit, are more *anabolic*—constructive processes predominating in their life, whence indeed the capacity of bearing offspring."

All this involves a very large subject for discussion and is sure to carry the student a long way into the domain of organic evolution. Fortunately its literature nowadays is easily accessible, and the student of sex will meet with much of it in almost any large public library in this country.

In summarizing their views Geddes and Thomson many years ago said that the general conclusion arrived at "recognizes sexual selection (so far with Darwin) as a minor accelerant, natural selection (so far with Wallace) as a retarding 'brake' on the differentiation of sexual characters, which essentially find a constitutional or organizmal origin in the katabolic or anabolic diathesis which preponderates in males and females respectively."

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*Brooks, W. K.: The Law of Heredity: A Study of the Cause of Variation and the Origin of Living Organisms. 1883.

From a general consideration of the law of organic evolution, in so far as it admits of absolute proof, all of its main factors have now been thoroughly established beyond all question of doubt, and the student of sexual science is next called upon to give his attention to a large array of important and accumulated facts that constitute the knowledge we possess having reference to the history, histological and physiological, of the basic morphological element of all organisms in both the plant and animal worlds, namely the *cell.* To understand the origin and history of sex one must be more or less familiar with the origin, growth, development and fate of these, the simplest of all morphological elements that possess life, the germinative cells. Too much importance cannot be attached to this subject, and for more than half a century past it has commanded the consideration of many of the best scientific minds the world has ever known. It is a well-established fact that in the case of the lower forms of life the cell represents the entire individual, and, as *protoplasm*, constitutes an element of high organization with respect to both its histological and chemical constitution. Each cell contains its *nucleus*, composed of *nucleo-plasma*, and it is this nucleus that represents the most important element of all organized life, the starting-point from which all living individuals spring. Having thoroughly studied the constitution of the cell in as many animals and plants as possible, the next step is to devote our attention to the matter of *cell division*, for without a knowledge of cell division it is quite impossible to comprehend the subject, so important in all sexual science, namely, of *fecundation*. *Mitosis* is the term now generally employed in describing the somewhat complicated series of events in the matter of cell division in all highly organized cells. This always commences in the *nucleus,* and has been fully described by many competent authors, and to these the reader is referred.

Another interesting chapter has to deal with *parthenogenesis*. It likewise has a large literature dating back to the time of Aristotle. No work on sex is complete that does not at least invite attention to it, and make clear to the student its nature. Briefly, then, parthenogenesis may be defined as the ability on the part of certain females in various families below the vertebrata to produce young without sexual connection with the male of the same species. This may occur in various degrees and in various ways, a description of all of which would occupy too much space in the present work. According to some authorities, parthenogenesis may be artificial, pathological, occasional, partial, seasonal, juvenile, and total. However, true parthenogenesis, where the habit is physiological and confined, is best seen in certain insects, in some crustaceans, and among rotifers. It has been studied in a great many groups by many investigators, and numerous treatises have been devoted to the subject. It can be studied with great advantage in the case of the plant lice (*Aphides*). In the case of many rotifers the males have never been discovered at all, while in other genera they are extremely rare. Sometimes the offspring are all of one sex, sometimes all of another (male or female). Bees offer another very interesting family of insects in which to study the parthenogenetic state, and they have been carefully studied by numerous observers, while others have confined themselves to the theory and the origin of parthenogenesis.* Briefly, then, this reproduction by a virgin may be defined as "one of the phenomena attending alternate generation among animals which have sex, a kind of agamogenesis, in which an imperfect female individual, hatched from an egg laid by a perfect female after ordinary sexual intercourse, continues to reproduce its kind for one or more generations without renewed impregnation."* It is also known to occur in some of the lower forms of plants. Geddes and Thomson contend that the "effects of parthenogenesis on the species deserve consideration, especially by those who find in sexual intermingling the sole fountain of specific variation;" that "parthenogenetic ova, so far as observed, form only one polar body;" that "parthenogenetic ova are here regarded as imperfectly differentiated female cells, retaining certain male or katabolic characteristics," and that "In origin parthenogenesis is regarded as a degeneration from the ordinary sexual process."**

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*Owen: Parthenogenesis; or, The Successive Production of Procreating Individuals From a Single Ovum. London, 1849.

Von Siebold: Beiträge zur Parthenogenesis. Leipzig, 1871. Also the well-known works of A. Weismann, H. Karsten, and many others.

It has long been a well-known fact that in the case of quite a number of different species of plants, as well as in some of the lower forms of animals, reproduction may take place without sexual conjugation. This process is termed *asexual reproduction.* Under it falls for the consideration of the student the entire process of growing certain plants from cuttings or slips, and even where plants reproduce their kind without any such artificial assistance. Among the sponges we meet with the same thing, and it is a well-known fact that such forms as the sea-anemones and the hydra polypes may be indefinitely reproduced by simply cutting them up into bits. All that is required is to keep the pieces in the necessary environment and make sure that each portion removed possesses a complete representation of the cells of the specimen operated on. The same thing happens to the common earthworms when intentionally or accidentally cut in two. Even the cephalic end of the animal will thus be perfectly reproduced. Many years ago I experimented in New Mexico on the removal of the limbs, or parts of limbs, in amblystomas and their larvae (*Axolotl*), and saw for myself the perfect reproduction of the amputated structures. During that time I also sent specimens of those forms to Miss de Chauvin, of Berlin, who was successful in similar experiments.† In 1882 I made similar experiments with lizards, and I have even noted the reproduction of certain parts in the *Canidæ* among mammals.†† Further I have made similar experiments with crustaceans, snails, star-fishes, and have observed it in many plants and among the *Protozoa;* but all this is only mentioned to invite the attention of the student to this mode of reproduction in the animal and vegetable worlds, and space will not admit of going further into it here.

Another very large subject forming a chapter in the science of sex, is the question of the *Alternation of Generations in Reproduction.* This but depends upon a rhythm between an anabolic and a catabolic preponderance in a relative sense. It is confined to certain plants and the lowest forms of animal life; and while with them such alternations may complicate the matter of heredity, the matter bears but very slightly upon the problem of sex in the mammalia, and especially in *Homo.*‡

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*Century Dict., Vol. V, p. 4,304.

**The Evolution of Sex, p. 174. It is interesting to know how those of the Catholic faith have introduced the phenomena of parthenogenesis to explain, in these days, certain parts of their dogma. A number of years ago, when I was delivering a course of scientific lectures at the Catholic University of America, I met Merwin Marie Snell, the Secretary to the Rector, Father Keane, of that institution. Snell contended, whether he believed the statement or not, that the birth of Jesus Christ was a parthenogenetic one, the like of which had never occurred before or since in history.

†Forel, Aug.: The Sexual Question, New York, 1908, p. 36. Such fields of research deserve still further cultivation and in a great many ways and by improved methods.

††Shufeldt, R. W.: Observations on the Habits of the American Chameleon (*Anolis principalis*). *Amer. Nat.*, Vol. XVII, No. 9, Phila., September, 1883, pp. 919-926, illus. This article also contains not a little on the mating of this species.

Shufeldt, R. W.: Notes on the Reproduction of Rudimentary Toes in Greyhounds. *Nature*, Vol. 38, No. 3, London, May 17, 1888, p. 173. The facts stated in this contribution were well known to the owners of the dogs referred to, as well as to other observers in the locality named.

‡Bell, F. Jeffrey: Comparative Anatomy and Physiology. Phila., 1885, pp. 23-88. This work gives good cuts of many of the forms illustrating alternating sexual generation, instructive examples of which may be studied among certain plants; the tape-worms; and particularly in the fixed plant-like zoöphytes known as hydroids, and the persons they throw off in the form of the free medusoids. The student should also consult the great works of Steenstrup, Owen, Haeckel, Weismann, and others.

With respect to the question of the *determination of sex,* the student of the science will soon come to realize that not only are there many present-day writers on this very important subject, but there likewise have been in times past; and, taken as a whole, they are responsible for an extensive literature devoted to this line of research. By the "determination of sex" is meant the discussion of the problem involving the solution of our being able to correctly determine through examination whether any given organism will in its development result in a male or a female individual. Upwards of 1,000 theories have been advanced on this problem, and little more has been accomplished beyond driving the question out of the theological and metaphysical arena into the biological one, where in time to come it may be definitely solved.

In man and other vertebrates both the fact and the time of sex determination are quite definite and, it may be added, occur soon in the life history of the embryo. This statement stands, however, only for normal individuals, and takes not into consideration hermaphroditism, and other unusual developments. With most of the lower forms, and even in the case of many of the lower vertebrates, as frogs and their allies, the matter turns out differently, and what the sex of any given individual may be may remain long undecided, or indeed sometimes even changed after it has started in one direction or the other. So in no instance in any animal can we ever tell the *exact instant* when maleness or femaleness of the developing organism is established. Moreover, it is absolutely more or less under the control of several very subtle factors. These factors are far more numerous than most writers are willing to admit. In the case of man, for example, there is the matter of race; of the age of the parents; the mental, physical, psychological and moral condition of the parents at the time of conception; the actual time that conception takes place, with respect to *both* parents, pre- or post-catemenial in the case of the mother, and all the various conditions that may affect the spermatic fluid in the case of the father; the nutrition of the mother after conception takes place; the nutrition of the ova in the uterus and its environment up to the instant that the combined conditions have definitely established the sex of the future individual in any given case. These and probably several other conditions form a list altogether too extensive to be discussed in the present connection; and then there are some theories utterly unworthy of any discussion, as the one advanced by Canestrini. The discussion of the matter of the age of the parents alone is voluminous, and the results quite unsettled at the present time. Personally, I am of the opinion that, everything else being equal, altogether too much importance has been attached to the factor of age, and that constitution and organization has far more to do with the problem. I have others in agreement with me in this view.

In sexual science the study of *twins* is an interesting one, and of some considerable importance. It not only refers to man, but the study should first be taken up in the case of plants, and carried up by the student to include all the higher vertebrates. Very naturally it is intimately associated with the whole question of *hermaphroditism* and with, not altogether very remotely, the subject of *teratology*. There are numerous general works extant on these matters, and a vast number of minor contributions and special papers and treatises. Especial attention should be paid to the articles, *Sex, Reproduction, Morphology*, and various others in the last edition of the *Encyclopædia Britannica* and similar works.*

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*Düsing, C.: Die Regulierung des Geschlechtsverhältnisses bei der Vermehrung der Menschen, Thiere, und Pflanzen. Jena, 1884.

Starkweather: The Law of Sex. London, 1883.

Debierre, Ch.: Malformations of the Genital Organs of Woman. (J. H. C. Simes, translation.) Phila., 1905.

Also *l'Hermaphrodisme*, by the same author, Paris, 1891.

Geddes, Patrick, and Thomson, J. Arthur: The Evolution of Sex. Parts I and II. New York, 1890, pp. 33, 34.

Shufeldt, R. W.: Deformities in Animals. *Western Field*, Vol. VI, No. 2, San Francisco, Calif., March, 1905, pp. 151-153.

Brief reference has already been made in a former paragraph to the structure and composition of the cell as it occurs in all of the higher animals, man included. With this in mind it is highly important to consider the entire sequence of phenomena that enter into the matter of *cell division* and the complicated series of events that follow it. This would be altogether too long a story to tell in an article like the present one, and, moreover, the literature upon the subject is now quite full and easy of access. The means of fertilization, the reproduction and the perpetuation of the enormous number of species of *plants* in the world is of itself a great history, full of interest and highly important. It leads to what we find in the animal world where the student should begin with the study of reproduction as it is exemplified in such lowly forms as the unicellular ciliated infusorians, and carry his investigations through the protozoans, sponges, and related groups, among all of which no true sexual organs exist. It is not until we come to certain of the cœlenterates that we meet with the most primitive types of sexual organs.* From this point on as we ascend the scale of animal life to include the highest mammals, the subject is one of the greatest complexity and variety. But the student should not cease with his investigations until he has carefully read the literature of reproduction that has appeared for the past forty years. The first three chapters of Forel's *The Sexual Question* (cited above) contain an admirable résumé of reproduction in man, with brief references to other animals. When I come to publish other papers on this subject, I shall draw not only upon my own fund of knowledge of general biology to illustrate the sexual life in man, but upon a great many excellent works I have in my personal library.**

About five years ago (1904) Richard Semon published his remarkable book *Die Mueme als erhaltendes Prinzip im Wechsel des organischen Geschehens* (Leipzig). This extraordinary work has chiefly to do with *heredity* and is certainly a masterpiece in its conception, research and philosophy. The effects of *initiation* are worked out with the greatest skill and thought. The student of the science of sex cannot afford to pass this volume by.† Another very extensive subject in sexual science, is the study

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Shufeldt, R. W.: *Ibid*, Vol. 8, No. 1906, p. 117.

Shufeldt, R. W.: Doppelköpfige Erscheinungen im Tierreich. *Natur und Haus*. Jahr. XIV, Heft 11. Berlin, March 1, 1906, pp. 165, 166.

*Bell, F. Jeffrey: Comparative Anatomy and Physiology. Phila., 1885, pp. 36-45. Very instructive drawings are reproduced in this useful little work.

**Some of these that have been of the greatest use to me are the following:

Huxley, T. H.: Anatomy of the Vertebrated Animals. London, 1871. Also the companion work on the *Invertebrata*.

Balfour, F. M.: A Treatise on Comparative Embryology. 2 vols., London, 1881.

Foster, M., and Balfour, Francis M.: The Elements of Embryology. London, 1883.

Thomson, J. Arthur: Outlines of Zoology. New York, 1892. This is a very useful volume.

Claus, C.: Elementary Text-Book of Zoology. Trans. and ed. Adam Sedgwick and F. G. Heathcote. New York, 1885. Parts I and II (2 vols.).

Wiedersheim, Robert: Elements of Comparative Anatomy of Vertebrates Adapted from the German by W. Newton Parker. London, 1886. The cuts in this volume are excellent, and there is also given a "List of General Works on Comparative Anatomy and Embryology," over thirty in number.

Gegenbaur, C.: Elements of Comparative Anatomy. (Trans. by F. Jeffrey Bell.) London, 1878.

Stratz, C. H.: Naturgeschichte des Menschen. Stuttgart, 1904.

Talmey, Bernard S.: Woman. New York, 1906. This remarkable little volume I received several years ago. It has since passed to an enlarged edition. There is a valuable bibliography appended.

Wilson, E. B.: The Cell in Development and Inheritance. New York, 1896.

Hertwig, O.: Text-Book of the Embryology of Man and Mammals. New York, 1892.

Korschelt, E., and K. Heider: Text-Book of the Embryology of Invertebrates. 3 vols. New York, 1899.

Various articles on the subject in the *Encyclopædia Britannica* and *Chamber's Encyclopedia*.

There are a great many other books in various languages on cellular development, anatomy of the sexual glands and organs in plants and animals of many kinds, on reproduction, heredity, and many allied questions which space limits forbid listing here.

†Shufeldt, R. W.: Psychical Inhibition and Its Consequences. *Med. Brief*, St. Louis, Oct., 1907.

of the normal and pathological anatomy of the generative system in all animals, and both sexes, including man. With this is associated the entire question of the physiology of *reproduction* in both vertebrates and invertebrates. That is the life history of the young from the earliest stages till the time of birth, and in many instances for a greater or less period afterwards. A large share of such information will bear upon questions to be dealt with further on. There is a fine literature extant on the anatomy of man and woman, as well as the embryology of the species. Such works should be closely studied and compared. As a matter of fact, in a thorough consideration of sexual science, the *entire anatomy* not only of man, but a good many other animals, should be understood in order to obtain a broad grasp of the subject in its entirety. So much depends upon a knowledge of structure—morphology. As to what is meant and the necessity for this, a single illustration may be cited, selected from no end of others. In the study of erotism and erotic foci, for example, it is now a well-known fact, in the case of all vertebrates, at least, such foci are not confined to the organs of generation but appertain to other parts of the body, as the lips, ears, umbilicus, etc., etc. Therefore, we should know the anatomy of such parts as well as the physiology of the entire organization.

Finally, it may be said that the line of study required in order to gain even a limited knowledge of the *question of sex*, is, by comparison, almost as nothing when one enters the very much larger field that takes into consideration the study of the *sexual question.* What has been outlined in the present introduction is a mere sketch of the subject required of the student in order that he may intelligently investigate the question of sex. Those that have been presented will naturally suggest other lines, that it may appear I have overlooked, though such is by no means the case, my reason being that I preferred to reserve my space wherein to discuss other matters, feeling sure that when the works recommended come to be examined, the reader can make any deficiencies good. Now in the broader conception—the sexual question—not only do we have to be prepared in all that has gone before, but in addition thereto a vast amount of other knowledge. It includes the entire range of human history from its dawn to the present time; it includes the sociology of man, and the corresponding habits and customs of animals below him in the scale of nature; it includes very extended researches and comparisons in the matters of religions, ceremonies, dress, ornaments, pastimes, politics, law, medicine, all the fine arts, singing, music, dancing, in short, to thoroughly comprehend the sexual question in its entirety no class or kind of knowledge should escape us. As the object of sex is the reproduction and procreation of the species, so the full consideration of the sexual question in man must take cognizance of *all* of that, not only what man has done and *is* doing, but in a comparative way what *all* other living species have done, and are doing. In fact, everything in the entire world, and all kinds of knowledge, may be traced in one way or another to the *sexual question.* This may seem to be a very broad statement, but it is nevertheless true. The trend of all living forms is the pursuit and accomplishment of individual happiness, even in the case of those whose happiness in life is to make others happy. No animal, man included, can be, in all senses of the word, happy, unless the sexual instinct and appetite is satisfied according to the demands of the individual. This is true even in man where we consider the cases pathological ones, as I have seen numerous instances of in my life.

Now, in the matter of our consideration of the "question of sex" and the "sexual question," there are certain subjects which strictly pertain to one or the other, while in the case of not a few they may be taken up under either division. In fact, there is no hard and fast line of demarcation between the two domains, that is, when we come to review the limitations of normal and abnormal anatomy and physiology in their broadest sense, for example, on the one hand, and sociology in its broadest sense on the other.

THE MEDICAL WITNESS.

By

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THE DOCTOR on the witness stand is an object of interest, even to himself. He is bursting with professional phrases and Latin terminology, which he hardly ever gets an opportunity to use, and he says to himself, "Here's my chance." He takes the witness stand with a sense of exultation. It is hardly too much to say that he holds spellbound the judge, the jury, the attorneys, the clerk, the sheriff, the bailiffs, the litigants, and the spectators. For the interest of what he says? No, but for the way he says it. No other sort of witness even remotely approaches the physician in his naive abandonment to the technique and terminology of his profession. The doctor as a witness is the standing joke of generations, and yet he shows no signs of reforming or even letting up. Gilbert Stewart, in his work on "Legal Medicine," gives a typical instance of medical testimony. He quotes a surgeon who, in testifying to the "black eye" of the complaining witness, said that he found him "suffering from a severe contusion of the integuments under the left orbit, with great extravasation of blood and ecchymosis in the surrounding cellular tissues, which were in a state of tumidity."

It must be admitted that the temptation for the doctor to display his professional learning, when he takes the witness stand, is great. His particular sort of learning lends itself to display. Every bone of the body, every nerve and muscle, every disease of the human organism, every remedy has its exact and sonorous Latin name, and he knows them all by heart. He has been bred to his technical vocabulary. His latinized, or altogether Latin, vocabulary is more familiar to him than its English equivalent. To put it in English would be an act of translation. Shall he, then, be called upon to hide all this hard-earned Latin—to say nothing of a sprinkling of Greek—under a bushel? Particularly, shall he lose his opportunity to match professional vocabularies with the medical witnesses on the other side!

It cannot be denied that this is hard, but it is exactly what the writer would propose. Let the medical witness speak English. When there is an English name for a bone, or a nerve, or a disease, or a remedy, let the physician on the witness stand use it and throw his Latin and Greek into the discard. He will thereby accomplish two things: he will make himself intelligible to the judge and jury, and he will relieve his profession of the too well grounded charge of pedantry. One of the most valuable qualities of the physician's testimony, indeed, is simplicity. He frequently has occasion to testify to matters which are at best difficult of understanding to a layman, and it is unpardonable for him to make these matters more difficult, if not wholly unintelligible, by clouding them with unnecessarily professional language. The writer is well aware that this theme has been hammered on times without end, and he professes only to add one more stroke to the plea for simplicity in medical testimony.

There is another quality in a physician's testimony that is perhaps of equal value with simplicity, and that quality is sincerity. Sincerity is the greatest word in literature, in other forms of art, even in life itself. It is of paramount importance to the witness. The physician on the witness stand should not only sincerely desire to get the exact truth as he sees it to the jury, but he should by his very manner attest that sincerity as a fact. It is the unvarying testimony of lawyers that the most valuable expert witness is he who speaks with such sincerity and conviction that his words carry the impress of authority. The opposing expert, though of equal learning and ability, may fail to reach the jury through his very manner of expression, suggestive of doubt, hesitation, or insincerity. This reaches the question of personality; but personally, it is to be remembered, is a cultivable quality.

But most of all, the medical witness should be impartial. The purpose of medical testimony should be solely to enlighten the juror and to aid in promoting justice. That purpose should not be, on any account, either to show the learning of the witness or to advance the claim of one side. In other words, the chief desideratum of medical testimony is to enable the court and jury to get at the very truth of the matter. And this brings us to the consideration of the much discussed question of expert medical testimony, which is the principal purpose of this article.

The present status of such testimony is unsatisfactory both to the public and to reputable lawyers and physicians. I say "reputable" lawyers and physicians, because it is quite possible that the present system is eminently satisfactory to certain shifty members of the legal profession who find in it a serviceable means of relieving criminals from the responsibility of their acts; and quite possible, also, that there are members of the medical profession who "stand for" it, because under a saner system their claim to be "experts" would fail of recognition. But most certainly the attitude of the public, where it is not one of cynical indifference, is one of affirmative hostility, and thus both professions suffer a measure of opprobrium and disrepute.

And why should not the attitude of the public be cynical or even hostile? In every *cause celebre* where the issue of insanity, for example, is involved, the spectacle is presented of two sets of doctors, arrayed in hostile ranks, one set affirming that the defendant is or was insane, the other set affirming that he is or was sane. The public wonders if there can *never* be a case so plain that the doctors will agree on it; the public suspects that if these same doctors would quietly get together and consult upon the case, free from the stress of antagonistic interests, they would probably reach a unanimous conclusion; and the public, knowing that handsome, if not lavish, fees are paid to these witnesses, reaches the conclusion that the doctors are just as partisan as the attorneys for the state or for the defendant. All this tends to undermine the confidence of the people both in medical science and in the integrity of the medical profession.

But the case against the medical witness is not so ugly as appears on the face of it. For let us consider under what circumstances the physician is called upon to testify. It is by no means a hit or miss process. The attorney does not subpoena the medical expert out of hand and take the consequences. No, he visits the physician. He lays before him the facts he professes to be able to prove, and he asks him if he can support his side on the basis of the facts stated. To this the physician says yes or no, and thus the bargain fails or is closed. It is purely an *ex parte* proceeding. The countervailing facts are completely ignored.

Now let us go a step further. The expert has been engaged. The case comes on for trial. The plea of insanity, let us say, is made. The expert is called. He is faced by a long hypothetical question, built up with the utmost particularity, and conforming with reasonable closeness to the facts stated to the physician in his office; for the attorney embodies in his hypothetical question only the facts proved by his own witnesses; he completely disregards the countervailing facts proved by the other side. So, after all, the charge of partisanship against the physician is greatly mitigated by the fact that all along he has been looking at the case from one point of view and judging it by one set of facts.

Yet, nevertheless, the charge of partisanship is freely made, and few physicians will deny that partisanship really exists. It manifests itself, very naturally, where great public interest has been aroused in the case and where possibly popular partisanship exists. The late DeSaulles case, for instance. The plea of emotional insanity (if a digression may be pardoned here) as an excuse for homicide, is, in nine cases out of ten, a mere device to give the jury an excuse to do what it wishes to do. In common life, and as a matter of common fact, it is simply sudden anger. Sometimes it results in a fist stroke, and that is assault; sometimes it results in a fatal pistol shot, and that is homicide or murder, as the case may be. The attorneys for Mrs. DeSaulles could not plead in her defense that her husband was cruel, for there is no law that justifies killing on the ground of cruelty; they could not plead that he was unfaithful, for unfaithfulness does not under the law justify killing; they could not plead that he withheld her child, because that particular form of torture is not, under the law, an excuse for homicide. They had to plead a defense which the law itself recognizes, and so they raised the plea of emotional insanity. It is venturing little to say that they did not expect to establish this legal ground of defense, but that they did expect, under the cloak of this legal plea, to show such a state of affairs as would have justified any woman in killing her husband. This plea enabled them to introduce the very testimony they wished to introduce, but there is no evidence that the jury found Mrs. DeSaulles insane. The facts which the attorneys claimed would prove her insane, the jury found would hold her guiltless. And it is in such cases as this, charged with emotional interest and deeply affecting the public mind, that the charge of partisanship among physicians is most frequently made, and where it is most likely to be in some degree true.

At any rate, the charge and the fact of partisanship constitute the very crux of the situation. The employing of experts by the contending parties in a suit is utterly indefensible. The experts' sympathies are inevitably enlisted on the side of the party he is representing. For one thing, he is eager to justify his employment. For another thing, he is committed at the very outset to the substantial truth of the facts upon which he bases his opinion, and this initial feeling is difficult to overcome. At the very least, he approaches the case in an unjudicial attitude. It seems absolutely plain that the first step toward reform is to make it impossible for either party to a law suit to employ and pay expert witnesses.

Affirmatively, then, what should be done? It has frequently been suggested that a medical expert should be appointed by the proper appointing power, and should be an officer of the court, available for service whenever an issue is presented which calls for expert testimony in the realm of medicine. This practice is followed in some European countries, but there are serious objections to it. In the first place, if there should be a medical expert at the command of the court, there is equal reason for other official experts—in chemistry, in engineering, in lumbering, in handwriting, and so on. If the appointing power were a political officer, say the Governor, his group of experts in each judicial district would be a fairly large and a peculiarly effective cog in the machine, if he were given to machine-building. Even appointments by the judge of such a group of permanent officials would be objectionable, since most of our judges are still elected on partisan tickets. It is hardly necessary to add that to elect such experts by popular vote would be wholly undesirable. In the second place, the sharp and increasing specialization within the medical profession renders it practically impossible to secure a practitioner who could be ranked as an expert in all the fields of medicine and surgery. And in the third place, a board of witnesses on a given medical problem is much more desirable and satisfactory than a single expert witness. This point, I think, does not need elaboration among doctors.

Undoubtedly the first step toward the reformation of the whole problem of expert medical testimony is the calling of an expert board by the trial judge, whenever an issue involving such expert testimony is raised; and next to the character and qualifications of these witnesses, the most imperative consideration is that their expert fees shall be taxed as costs in civil cases, and in criminal cases paid from a court fund available for the purpose. In civil cases these fees could be apportioned among the parties in the first instance, but in the end should follow the costs of the suit. In all cases the amount should be fixed by the judge.

This procedure would at one stroke eliminate the fundamental evil of the present system; it would place the physician in a judicial and an impartial attitude, and would silence the charge and remove the fact of partisanship. This is a consummation devoutly to be wished. The wonder is that this essential and primary step or reform has not long since been taken. Two reasons why it has not at once suggest themselves: first, the essential conservatism of both the legal and the medical profession. Is it in Iolanthe —it is certainly in one of Gilbert and Sullivan's comic operas—that this clever satirical skit occurs:

> "The law is the true embodiment
> Of everything that's excellent;
> It has no kind of fault or flaw,
> And I, my lords, embody the law."

And second, the opposition of unworthy elements in both professions. If such a board as has been indicated were to be named by the court, many doctors would be eliminated from the expert list, and many lawyers would suffer from a lack of pliant experts. But there are less unworthy reasons why this step has not been taken, and they will be suggested in another connection.

And this board should invariably be named by the court. While trial judges are still elected by the people, and that, too (most unhappily), on partisan tickets, they are the least political of our public officials, and they have, moreover, a great and just pride in their office, and a wholesome respect for the appellate courts. They know the standing of the physician in their districts. In passing, however, it should be said that they should not be restricted to their districts in the nomination of experts. For various reasons an expert within the district might be disqualified for impartial service. This board could be called upon the motion of one of the parties or by the judge at his own instance, and the examination in chief could be conducted by one of the parties or by the court, but in any case the right of cross-examination should, of course, be maintained.

But let it not be thought that this plan would settle all the difficulties of expert testimony. It is a first step only, though an essential one. The hypothetical question still bars the way. To resume the illustration of the insanity plea, if the claim were made that the defendant was insane at the time the act in question was done, but not now insane, the testimony would be by way of the hypothetical question. The defendant's attorney would frame his question on the facts he professed to have proved. The state's attorney would set forth an entirely different set of facts. The expert board might well say, on the defendant's facts, that the defendant was insane; but on the state's facts it might unanimously declare that he was sane. That is, the expert witnesses, under the proposed law, are released from the pressure of partisanship, but they are foiled by an issue of fact. The result is that the jury must decide which set of facts is most nearly in accordance with the evidence, and then give such weight as it thinks proper to the expert testimony. What shall be done with the formidable fact of the hypothetical question, a doctor should perhaps not venture to say, since it is a question of legal procedure; but the writer believes that substantial justice would be much more often reached if the expert board should be required to attend upon the court during the testimony of the witnesses, relating to the facts upon which expert opinion is to be based, that they should be permitted to interrogate the witnesses, and that they should file their report, subject of course to attack by cross-examination. If the subject of the inquiry is in court and his present condition at issue, then the board could conduct an examination privately and apart, and file its report, also subject to attack by cross-examination.

Under this system there would necessarily be an aggrieved party. The question arises, should this aggrieved party have the right to subpoena additional expert witnesses, to be paid only the amount received by an ordinary witness? Just such a provision is inserted in a proposed law governing expert testimony in California. In the November, 1917, number of the legal journal, "*Case and Comment*," Rochester, New York, Oscar C. Mueller of the Los Angeles Bar, under the title, "A Remedy for the Evils of Expert Testimony," quotes this proposed Act in full. It was prepared by him in collaboration with an eminent physician and an equally eminent judge. In 1913, it was passed by the senate of California without a dissenting vote, but was not voted on in the assembly. In 1915, the bill passed both the senate and the assembly, but did not receive the approval of the Governor. In 1917, the senate again endorsed the measure, but it failed in the assembly. This bill contains the provision that any party may call other experts if he is dissatisfied with the court's experts, but that they shall be entitled to ordinary witness fees only, to be taxed with the costs. There is some reason in this. The attorney against whose interest the expert board has gone may well say, "Am I to be precluded by the evidence of this board, when I can find other experts who will reach an opposite conclusion? But, again in the interest of substantial justice, it must be seriously doubted if the possibility of opening up the flood-gates of expert testimony would not so becloud the issue as to render the ascertaining of the right of the matter more difficult. If the expert board should submit a divided report, no party would be seriously aggrieved. If it should submit a unanimous report, even so it would not be conclusive. But it would carry very great weight—and, after all, is it not right that it should carry very great weight? We are seeking justice; let us seek it without a too meticulous insistence upon merely technical "rights."

Enough has been said to indicate that this big question is not easy of solution; and the "more worthy reason" referred to on a previous page, why some measure of reform has not long since been accomplished, is now more fully revealed. The writer has used throughout this article the sole illustration of insanity, but, of course, the considerations set forth apply with equal force to every case where expert medical testimony is required. Indeed, any satisfactory law on the subject must embrace in its provisions all classes of expert testimony.

But the fundamental provision of any such law must be that the court shall choose the experts and that their expert fees shall be ultimately charged in the costs if the case be a civil one, and paid from a court fund if the case is on the criminal side.

THROMBOSIS OF THE POSTERIOR-INFERIOR CEREBELLAR ARTERY.

By

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THROMBOSIS of the posterior-inferior cerebellar artery is said to be of unusual occurrence. Yet the writer in a short period of two years has observed four undoubted cases. The condition is therefore fairly common. This study is inspired by the desire to familiarize the profession with the anatomic, pathologic and symptomatic data, so as to render the diagnosis easy.

Etiology.—Thrombosis is generally secondary to a previous arteriosclerosis, especially the syphilitic type which is accompanied by plaques in the vessel wall. The age is usually over forty. In the young it is nearly always of syphilitic origin. Other evidences of generalized arteriosclerosis are usually evident.

Anatomy.—The posterior-inferior cerebellar artery is the largest branch of the vertebral from which it passes obliquely backward around the upper part of the medulla, at first between the roots of the hypoglossal nerve, and then between the roots of the spinal accessory and vagus nerves, over the restiform body to end on the inferior surface of the cerebellum. Its branches to the cerebellum anastomose with those of the anterior-inferior cerebellar artery; its branches to the medulla are thought to be end arteries. That this is only partly true, seems to be borne out by the fact that almost complete disappearance of symptoms is the rule. This would argue for some collateral circulation.

Pathology.—The occlusion of the posterior-inferior cerebellar artery causes a definite lesion of the medulla—a localized softening which is strictly limited to its lateral half. This softened area extends laterally from the restiform body to the inferior olive, and vertically from where the restiform body passes into the cerebellum to about the middle of the hypoglossal nucleus. That is, it affects the formatio reticularis and restiform body of the same side as the involved artery. The structures involved in this softened area are the following nuclei and their roots and the enumerated tracts:—

(a) The descending sensory root of the fifth nerve,

(b) the nucleus ambiguus—the combined nucleus of the glossopharygeal and vagus nerves.

(c) the glossopharyngeal nucleus,

(d) the vagus nucleus,

(e) the dorsal and ventral auditory nuclei—Deiter's nucleus and the vestibular and cochlear nuclei,

(f) the cochlear nerve root,

(g) vasomotor and cervical sympathetic fibres,

(h) the ventral and dorsal spino-cerebellar tracts, which include the ventrolateral ascending tract of Gowers, the direct cerebellar tract of Flechsig, the descending vestibular tract, and the cerebello-olivary tract.

Symptoms and Signs.—The manifold symptoms and signs produced in various combinations are the direct results of the loss of function of the fibres and cranial nerve nuclei involved. It is known as the Babinski-Naegotte bulbar syndrome. The onset is usually sudden with giddiness and a marked tendency to fall to the affected side, due to the involvement of Deiter's nucleus. There is no loss of consciousness.

Loss of appreciation of pain, heat and cold, partial or complete, over the whole or part of the face on the same side as the lesion is due to the involvement of the descending sensory root of the fifth nerve. This may affect only the first and second branches of the fifth nerve. The first branch descends lowest in the medulla, next the second branch and highest is the third branch. Therefore, in a lesion involving the lower part of the medulla the third branch may escape. Loss or impairment of pain and temperature sense over the opposite side of the body from the face down is due to involvement of the heat, cold and pain fibres which have not yet crossed. If the amount of damage is small and only part of the fibres involved, this sensory disturbance may be entirely absent or an intact area may be left between the opposite side of the face and this side of the body. If the damage is extensive, the face on the side opposite to the lesion may be included in the impairment of pain and temperature senses. Paresthesia or pain in the area of sensory disturbances is frequent.

Touch, tactile discrimination, deep pressure and muscle senses are intact over the face of the same side of the lesion, because these sensations after reaching the Gasserian ganglion enter the sensory root and go directly to the chief trigeminal nucleus and thus escape the destruction of the descending sensory root. Touch, tactile discrimination, deep pressure, and muscle senses are also intact over the rest of the body.

Paralysis of the sympathetic fibres entering the lower part of the cervical cord, which do not cross until they reach the upper part of the medulla, results in retraction of the eyeball, contracted pupil, drooping of the upper eyelid, narrowed palpebral fissure, loss of sweating of face and neck, and injected conjunctiva—all on the same side as the lesion.

Involvement of the dorso-spino-cerebellar tracts causes ataxia of arm and leg on the same side as the lesion. There is an inclination of the head to drop to the same side; the patient often strikes up against objects on the same side; there is hemi-asynergy, and the gait is crab-like, closely resembling the cerebellar type.

Difficult swallowing results from homo-lateral paralysis of the muscles of deglutition and soft palate. Difficult phonation with voice low and hoarse is due to paralysis of the vocal cord on the same side as the lesion. Laryngoscopy should never be omitted in any suspected case. This has confirmed the diagnosis in the two instances where it has been available. Dysarthria, Cheyne-Stokes respiration, rapid pulse, coughing, vomiting, obstinate hiccough may all be explained on the basis of the vagus involvement.

Loss of taste of the posterior part of the tongue on the same side, pain and temperature sense, impairment of the pharynx with normal tactile sense, vertigo, Meniere's syndrome, deafness, and auditory hallucinations on the same side as the thrombosis, may also be explained by the pathology of the lesion.

No motor paralysis occurs unless the thrombus extends into the vertebral or basilar artery. Then a crossed motor paralysis results—affecting the face, tongue, diaphragm and vocal cord on the side of the lesion, with the arm and leg of the opposite side. These paralyses are usually slight and the facial paralysis may be only temporary. A rare occurrence is a paralysis of the arm of one side with the leg of the opposite side.

The reflexes are not characteristic. There may be loss of the conjunctival reflex on the side of the lesion, due to fifth nerve involvement. Loss of tendon reflexes may also occur on the same side. On the opposite side, exaggerated tendon reflexes, normal or exaggerated skin reflexes, Babinski's phenomenon, and ankle clonus may occur.

Prognosis.—In two to six months the symptoms all disappear, though slight sensory changes are usually permanent.

Differential Diagnosis.—The differential diagnosis will occasionally have to be made from

(a) Cerebellar abscess,
(b) Cerebellar cyst,
(c) Cerebellar hemorrhage,
(d) Cerebellar encephalitis,
(e) Primary defect of the cerebellum,
(f) Syphilitic cerebellar hemiplegia,
(g) Cerebellar tumor, particularly tuberculoma,
(h) Cerebellar-pontine-angle tumor,
(i) Serous meningitis of the posterior cranial fossa,
(j) Sarcoma of the medulla, and
(k) Glioma of the medulla.

Case 1.—G. W., male, 62 years old, was seen in consultation with Dr. Joseph Samenfeld on February 9th, 1915.

Family History.—Father died at 59 of apoplexy, mother died at 81, one brother died at 60 of apoplexy, one brother blind at 60, one brother living and well.

Past History.—Four children dead, two died in infancy, one at 19 of epilepsy, one of diphtheria. Three sons living and well. He was always well until two years ago when he began having painful cramps in legs on walking.

Present Illness.—Two months ago woke up with a terrible pain in hs head and found that he could not move his right arm and right leg. There was no unconsciousness, no paralysis of face. He was in bed from four to five weeks. The paralysis rapidly cleared up. The patient now complains of peculiar sensory disturbance in his left face and right arm and right leg, that is, on shaving or bathing he does not perceive the proper temperatures in these parts. There has been persistent dizziness.

Examination.—Reveals increased reflexes, no paralysis, thermo-anesthesia and analgesia of left face, right arm, and right leg, miosis and pseudoptosis of the left eye. On subsequent examination on the 7th day of October, 1915, similar findings plus diminished hearing of left ear; no paralysis or weakness. He has lost the sight of his left eye due to intraocular hemorrhage. Cardiac and general signs of arteriosclerosis, myocarditis, and cardiac dilatation are present.

Diagnosis.—Thrombosis of the left posterior-inferior cerebellar artery. The attacks of intermittent claudication of legs, together with his ocular and cardiac findings indicate the widespread vacular changes that have occurred.

The characteristic sensory disturbances, together with the pseudoptosis of the left eye localize the lesion. The general physical examination speaks for a vascular disturbance—in the nature of a thrombosis, which originated in the left vertebral artery and extended into the posterior-inferior cerebellar artery.

Case 2.—Jewish Hospital, No. 31,683, J. B., 43 years old, married, tailor by occupation, was admitted on May 11th, 1915.

Family History.—Negative.

Past History.—18 years ago an attack of rheumatism without sequelæ. Wife one miscarriage.

Habits.—10 cigarettes daily, no alcohol, denies venereal diseases.

Present Illness.—Five days before admission was taken with a severe right frontal headache. Twelve hours later while at the toilet he felt chilly, lost the use of his voice, becoming very hoarse. He walked to his room. The next day his headaches were much worse, also felt peculiar in his left arm and left leg, though there was no paralysis. He saw double, no convulsions, no vomiting, no unconsciousness.

Examination.—Marked alopecia of scalp, right pupil smaller, right eyeball moderately congested, edema and pseudoptosis of right upper lid both pupils reacted to light and accommodation. Lungs, heart and abdomen negative. The abdominal reflexes, Achilles jerks and knee jerks present and equal. Right corneal anesthesia. No Babinski, no hypertonicity of muscles, no nystagmus, no paralysis. Thermoanesthesia and hypoalgesia of right face and left extremities. Marked right sided ataxia, cannot stand on right foot. Both ears show retracted drums. Fundi oculi normal. Laryngoscopic examination shows right sided abductor paralysis. Spinal fluids—May 19th, shows great pressure, clear, one millimeter albumen ring, reduces Fehlings, negative globulin, 5-10 lymphocytes per field, occasional degenerated enthothelial cells, sterile culture, negative Wassermann. Blood Wassermann negative. Fluoroscopy shows no cardiac enlargement, and very slight dilatation of aortic arch. Urine—spec. gr. 1012 to 1026, occasional white blood cells, red blood cells and epithelial cells. Blood pressure: Systolic, 168 to 184; diastolic, 120. Temperature, pulse and respiration normal. Two weeks after admission still complains of headache and peculiar sensation on left side. October, 1915, patient is able to walk up ladder and wash windows of his candy store. He complains that in making ice cream or in handling ice his left hand does not perceive how cold it is; perception is perfectly normal on the right side. He has a burning sensation in his lower left extremities, no dizziness. Examination shows marked temperature disturbance over left arm and leg, less so over the right side of face. Right corneal anesthesia, hypoalgesia of left leg, less so of left arm; no ataxia; pseudoptosis, miosis and enophthalmos of right side still present.

Diagnosis.—Thrombosis of right posterior-inferior cerebeller artery.

The ophthalmologist had erroneously diagnosed the patient's conjunctival congestion as inflammation. After hearing the history of sudden onset with dizziness and hoarseness, the patient's drooping eyelid gave the diagnosis away before examining for the typical sensory changes.

Case 3.—Jewish Hospital, No. 37,188. David H., 67 years old, was admitted April 27th, 1916. Five years ago the right side of his body suddenly became paralyzed. He was conscious, but could not talk for about ten days. This weakness gradually cleared. Since then he has had frequent headaches. Two months ago he suddenly experienced difficulty in swallowing and developed a marked weakness and peculiar sensory disturbances of the left half of his body. He was in bed four weeks, being fed with a spoon. His weakness in walking gradually cleared up. He then developed an ulcer of the leg and was sent to the hospital for its treatment. I was called in consultation by his attending physician, Dr. Rosenthal, on account of his sensory disturbances. Examination revealed marked huskiness of voice with indistinct enunciation. There was no sensory or motor aphasia, no paralysis of face or extremities. A slight drooping of right upper eyelid and marked congestion of right conjunctiva were present. The pupils reacted to light and accommodation. Loss of pain and temperature senses over the left side of face, neck, chest, abdomen, arm and leg were demonstrated. No tactile anesthesia was present. An ulcer of the left leg on the outer surface below the knee was present. Slight ataxia of right side was present. On laryingoscopy, the right vocal cord is seen to be retarded in its movements. The fundi oculi are normal. The urine shows a specific gravity of 1013, trace of albumin, and occasional hyaline casts. Blood pressure: Systolic, 180 to 200; diastolic, 90 to 120. The diagnosis is thrombosis of the right posterior-inferior cerebellar artery.

Case 4.—H. K., 45 years old, was seen in consultation with Dr. Henry Joachim. In October, 1915, he awoke with dizziness. He vomited and had slight deafness. After being sick for three weeks, he made a complete recovery. A history of lues twenty years ago was obtained. March 4th, 1916, his left toes felt numb and he slightly dragged his left leg. The next day he was dizzy and had a feeling of pins and needles in his left foot. There was no vomiting. This lasted four weeks. Dr. Joachim's examination on May 1st, 1916, revealed Argyll-Robertson pupils, anisocoria, contracted pupils, Rombergism, absent abdominal reflexes and a left Babinski. The blood pressure was 120 systolic, 80 diastolic. Wassermann, 4 plus. He was put on mercury inunctions, and potassium iodid internally. The third episode began December 17th, 1916, with hiccup right sided headache, vomiting, vertigo, deafness, staggering to the right, tingling of he left arm and leg, huskiness of voice, and regurgitation of food through the nose. I first saw him at this time. Examination revealed small irregular pupils, not reacting to light. The right upper eyelid showed pseudoptosis. Diminished pain and temperature sensations of the left arm and leg were present. The knee jerks were exaggerated. The ankle jerks were present. Marked dizziness was caused on attempting to rise. No nystagmus on lying down, but on attempting to sit up vertical nystagmus was produced. No motor weakness of extremities. This patient's attacks were recurrent thrombosis of his cerebral vessels on top of a luetic endarteritis. The findings in his last attack are typical of a right sided thrombosis of the posterior-inferior cerebellar artery.

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EDITORIALS.

Conducted by

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PSYCHANALYSIS OF MENTAL TORTICOLLIS.

Under the title "Mental Torticollis," L. Pierce Clark* describes a number of mental states. He is disposed to agree with those who deem the primary fault in these cases to be in the general mental makeup. The defect is one of emotional infantilism, the torticollitic being a profoundly neurotic individual whose infantile emotional life is an arrest or fixation in a diffused way on the parent, on himself, and to a less degree upon his own sex. Because of this emotional arrest the main trends of character are weak and inadequate, and in the early adult period, with new adaptations to complicated life tasks, and especially toward the opposite sex, the subject breaks down with outspoken psychoneurotic symptoms. Usually the torticollis is not one of the first nervous symptoms, but occurs later along with the efforts at repair of the nervous illness. It represents a turning away from the difficulties of life and a regression to crude acts or movements with an intense satisfaction content to the unconscious, infantile life. The patients examined were all muscularly autoerotic, and had placed great dependence upon these satisfactions in infancy. Their feelings of inferiority and inadequacy were like those of profound psychasthenics. Hence the fact that such subjects do not submit readily to psychanalysis. Weeks and months of readjustment of the emotional life by re-education must be instituted between certain phases of analysis. By such means the great majority of cases can be cured, though much time and patience are required.

An analysis of the cases reported shows that there are many different psychoses included under mental torticollis. Some of them belong to the type of paranoia which Benjamin Rush** over a century ago called Dissociation. Others are cases of adolescent stress in which anxiety states are dominant. Others are cases of adolescent uncertainty in which obscessions occur. Many of these conditions are charged by Freud to sex trauma, but the failure of psychanalysis in the hands of Dr. Clark significantly indicates that the constitutional factor, not the exciting cause, is the important element.

PSYCHO-THERAPY.

Perhaps no other subject in the domain of neurology is receiving so much attention as that of the mental treatment of disease with its concomitant psycho-diagnosis, and its tedious, if not uncertain, psychoanalysis, which necessitates delving into the subject's very thoughts, both conscious and unconscious, in search for hidden complexes.

The tendency of the psychoanalyist apparently is to ignore the physical element—the neuron—and to define disease in terms of psychology and assign the mental state—a hidden complex, if you please—as the sole etiological factor, overlooking the fact that the mind is but a function, *i. e.*, the result of the activity of the brain, and that will is the final decision or action resulting from the association of conflicting ideas, hence not even a separate and independent property of mind.

**Archives of Diagnosis*, July, 1917.
***On the Mind*, 1810.

We read of psychological tension, hypotension, etc., but little of neuron potential, etc.

In all so-called mental diseases there is either directly or indirectly an involvement of the brain, which is the source of the will, which in turn, under normal conditions, is the regulator, but *never* the *motive* force, of the brain.

In other words, will is to the brain what the governor is to the steam engine, *i. e.*, receives its motive force from the very power it is designed to regulate.

Since the mind is but a function of the brain, it is apparent that its power is proportionate to the neuron energy of the psychic centers, and since neuron weakness is accompanied by irritability which, involving the lower neurons, widens the gap of weakened volitional control, the afflicted is in the position of one attempting to lift himself out of the quicksand by his own boot-straps.

Hence the fallacy of expecting the will to be able to restore or even control perverted brain action, which is the basic fallacy of mindhealing. The apparent success of psychic treatment is due to at least two fundamental facts: (1) it may supply a *vis a tergo* to the inertia of the physically restored neurons which are thereby revived into activity and restored to their normal relations and functions; but even here there is danger that the overly tired neurons be called into activity before recuperation is complete, and the patient lapse into his former state or develop new phases of his neurosis. This is exemplified in the case of a fractured bone, the related parts of which are left useless from having been placed at rest, so that it becomes necessary for the patient to overcome the resulting inertia, but in the event this is begun before the fragments are united, the condition is but aggravated. (2) The symptoms of the psychoneuroses may be overcome by excluding them from the field of consciousness by the induction of a "negative hallucination" (displacement or substitution), which does not constitute a cure of the underlying physical condition to which is due the emotionalism which gave them birth.

In other words, psycho-therapy apparently only relieves symptoms, and may be the means of bringing new symptoms into existence, unless the physical condition be previously restored; thus placing one in the position of ignoring the warnings of nature and, to the mental healer, demonstrating the "wonderful power of mind over matter," but to the scientific mind it demonstrates that man can be as intelligent (?) as the proverbial ostrich which, burying its insignificant head in the desert sand, magnanimously offers up its enormous body as a living sacrifice to the pursuing foe.

While it is certainly true that mild cases of the neuroses, as with all classes of functional diseases, may recover without treatment, it is as certainly true that psychotherapy is to be used in selected cases and with rare judgment by the competent neurologist.

Since mind is the product of matter, it would appear that the primary element in the psycho-neuroses is neuron instability which permits loss of mental control; if not, certainly prolonged perverted activity will produce neuron weakness, if it do not cause organic change which cannot be restored through mental action. Yet we read such apparent solecisms as, "Nervous health is a mental state, not a physical condition," and "Nervousness, then, is truly a mental, not a physical illness."

Several years ago the author wrote:*

"Much of the prevalent erroneous ideas regarding disease of the nervous system is due to the misconception of mind and its relation to brain.

"We fail to recognize that the brain is the organ of mind and that mental operations are possible only in and through the brain. Hence psychology displaces anatomy, physiology, histology and pathology in the study of deranged cerebral activity, which naturally leads to erroneous therapeutic measures.

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*St. Louis Clinique, March, 1910.

"In thus viewing mind as separate from matter, the brain, as well as the body itself, is disregarded in considering the causes and treatment of many diseases of the brain, and leads to the erroneous conclusion that 'diseases due to mental causes cannot be cured by material medicines.'

"There are no purely 'mental causes,' properly considered, of brain disease; unrestrainable emotions, instead of being the causes of brain diseases, are the result of previous disease of the brain, causing weakness of control, or loss of equilibrium between action and restraint which permits the emotions to run riot.

"Emotionalism which permits unrestrainable anguish, worry, grief, fear, etc., which are generally considered as causes of many diseases of the brain, is the result of previous brain weakness, a fact that frequently leads to serious delay in proper treatment.

"Diseases resulting from intellectual abuse can no more be classed as 'mental causes' than can bodily dissipations and voluntary loss of sleep, in contradistinction to inability to sleep as the result of disease.

"Mental activity means brain action, and brain action is not only accompanied by chemical changes within the brain cells which results in fatigue, or, if sufficiently prolonged, causes exhaustion, but there results poisonous materials (literally, ashes), which enter the circulation and acting upon the muscles, weakens them,* so that it matters not which horn of the dilemma we hold, the result is the same, *viz.*, physical disease.

"We should bear in mind that mental activity means physical action and that 'mental symptoms,' so-called, are manifestations of disordered brain action and hence no more amenable to 'mental healing' than are diseases of the other organs.

"Owing to the superstitions regarding diseases of the nervous system, they have in all ages proven a fertile field for charlatans who have not failed to take advantage of popular ignorance, and their apparent cures, to those not skilled in these diseases, are often startling, if not miraculous.

"There has been, at all times, a fascination for the mystical, even mythical, and this is especially true in the realm of medicine, which has led to the 'rise and fall,' of innumerable 'pathies' and 'isms'—the more mythical and unreasonable, the greater its success and longer its life, and apparently the limit of human credulity has not yet been attained."

Psycho-therapy, *per se*, applied by a skilled neurologist in selected cases, has a distinct field of usefulness in medicine; but promiscuous "mental healing" is certainly pernicious, since the results of the ordinary "faith cures" depend upon establishing a "settled philosophy of life" by virtue of which the subject stoically ignores nature's warnings of impending disease, as does the pedestrian who closes his eyes in crossing highways, and possibly "gets by"—for a time. D. S. B.

PSYCHOANALYSIS.

The conception of the Freudian censor is the occult one of a devil, not the benign altruistic one of the secondary ego of the alienist.

Discussing this, Havelock Ellis remarks that Freud** was the pupil of Charcot and under Charcot's inspiration was preparing to devote himself to the physical aspects of nervous disease and to physical treatment, especially electro-therapeutics. Charcot was indifferent to the psychic side of his cases and—following the French medical tradition and well secônded by his pupils—he regarded the recognition of a sex element in the causation of disease as degrading. That attitude was the outcome of the whole of Charcot's temperament and habit in approaching disease, as was clear at once to anyone who saw him—in his dealings with patients at the Salpetrière. One realized that he felt a complete mastery of the case and that he regarded it as a purely physical problem; for the patient himself, and for any communication that the patient might be able to make, he felt evidently an almost contemptuous disdain. There could be no attitude more directly opposed to that which Freud ultimately reached. But it was in that atmosphere Freud was trained to approach nervous disorders. We can well believe that, when at length faced by the mysterious Sphinx of sex he had flouted and met with the stern demand why he had persecuted her, Freud passed through a deep spiritual upheaval, a complete revelation comparable to that experienced by a still greater Jewish apostle of truth in days of old on the road to Damascus. If we are tempted to think, as most of us certainly are tempted to think, that the convert has sometimes been dazzled by his new vision and drawn by his convictions to excess, we may learn to view these results with a more sympathetic tolerance if we understand how, certainly on the basis of a favorable soil, they were originally brought about.

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*Neurasthenia and Its Mental Symptoms—Edward Cowles.

***The Bookman*, September, 1917.

That Charcot here failed to recognize the falsehood of extremes is evident. Nor did he recognize the truth of Tennyson:

Hold fast the good, define it well
For fear divine philosophy should push beyond her bounds, and be
Procuress to the Lords of Hell."*

Charcot, however, recognized that hysteria had a metabolic disturbing element, and that scleroses resulted from its perturbed vasomotor state, a result not a cause. Neither Charcot nor his disciple Freud was an alienist. The law of the etiologic moment was ignored by both, psychically by Charcot, physically by Freud.

Psychiatry dominant in the 80s made mental phenomena due to a cerebral teratology, cerebral vasomotor disorder and cerebral pathoanatomy. All these were modified by the periods of stress and the state of the constitution at a particular moment. Hysteria consisted of various phenomena, hence it could only be defined as a constitutional instability, which through fatigued, retarded, weakened, undeveloped or absent inhibitions, responds excessively in an eye, ear, throat, lung, temperative growth, stomach, liver, heart, intestinal, bladder, joint, nerve or mental direction, to a slight irritation coming from within or without. There is no grave disorder which is not mimicked by hysteria. The long standing paralyses, joint disorders, severe convulsions, sudden deafness or sudden blindness, as well as the sudden numbness, are all products of the hysterical constitution. This condition, while it is often of congenital origin, may result from traumatism, from sunstroke, from an electrical shock, and after the great fevers (typhus, typhoid, long continued attack of scarlet fever), rarely after measles, smallpox or the allied contagions (like chicken pox, genna, measles, etc.). The essential element in hysteria, as in epilepsy, is the constitution, and the hysteric constitution owes its peculiarities to the condition of the inhibitions or of the associating power.

That Freud failed equally to recognize the physical as Charcot the psychic results and factors in hysteria, is evident in the fact pointed out by Havelock Ellis, that he lately declared:

"The doctrine of suppression is now the foundation pier on which the structure of psychoanalysis rests. There was also the doctrine of conversion, by which an emotional experience may be changed into a physical, and usually pathological, phenomenon having no conscious or apparent resemblance to its emotional cause, which this process, more or less, relieves and removes, so that, as Freud expressed it, 'the hysterical symptoms are built up at the cost of the remembered emotions'; at the origin the physical pain or disability had been associated, in time, with the emotional experience, but the link had never been recognized in consciousness. We see again in this book the conception of 'symbolism,' which was afterward to play so important and so much discussed a part in Freud's teaching; in this first book, however, the symbolism of objects was, as Freud has since acknowledged, overlooked though present, and the symbolism revealed was a symbolism of situations, a sexual situation being represented by an analogous situation on a different and more avowable plane; it was, therefore, more a physiological than a psychic symbolism. In this first book, once more, we have the tendency for the sexual exciting cause of the disorder to be traceable further and further back toward early life, although there was, as yet, no definite assertion of 'infantile sexuality,' which was not put forward until 1905. Finally, the Freudian method of treatment was in principle here established as a method of drawing out and bringing to the surface of consciousness a repressed and corroding element, a method by Breuer termed 'cathartic,' though Freud himself later termed it 'analytic,' probably because he felt unable to accept Breuer's conception of 'a foreign body in consciousness.' "

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*In Memoriam.

Havelock Ellis admits that Freudian tendency to looseness in definition. This is to be noted, but not altogether to be blamed. Definitions are not so essential in the biological sciences as in the mathematical sciences. Moreover, the Freudians are at the beginning of their science, if science it may be termed, while precisely accurate definitions come at the end of an investigation and not at the beginning. This looseness of definition has been a part of the vital growth, the perpetually shifting new development, which has so strikingly marked Freud's work.

Definitions in any science cannot be otherwise than relative. It was this English tendency shown by Ellis, to conceive of definitions as defining only when they defined absolutely, that led William Harvey to remark of Lord Bacon that he wrote on science like a Lord Chancellor. The result of such definitions is the tyranny of the label which has cursed medicine as it did biology ere the mutation of species was proven. Generalized types were regarded as non-existent. A singular illustration of this error appears in Ellis and Freud both.

"Freud's conceptions have indeed grown marvelously. The *Studien über Hysterie* have long been left behind. He is perpetually remoulding his ideas, as his experience widens and his insight becomes more penetrating, introducing new ideas, extending them into new fields. From hysteria psychoanalysis was applied to other groups of psycho-neurotic disorders; first to morbid obsessions and impulsions, then to all sorts of psychic disorders, including various forms of insanity, though it may be doubted whether it has worked out as well in any of them as in hysteria; and in the severe forms of mental disease, as Freud himself has pointed out, it is helpless. The application of the Freudian ideas to the normal child was, as has been said, a pivot on which the whole doctrine has turned. It involved, first of all, a new elaborate analysis of all that is meant by sexuality. The infant, the young child, is, of course, not sexual in the limited and localized sense which we have in mind when we think of sexuality in the adult. In the young child, as viewed by Freud, sexuality is generalized and may take on many forms—forms which in later life, if we found them associated with a specific underlying sexual impulse, we should call perverse. Therefore, Freud regards the child as 'polymorph-perverse' and, as is indeed well recognized (and as my own investigations had repeatedly shown), the sexual perversions of later life may largely be regarded as a persistence of, or a return to, the impulses of child life. The extreme and pronounced way in which Freud set forth his doctrine of infantile sexuality aroused much opposition and resentment among many people who failed to realize that sex in early life is a very different thing from sex in adult life. Later Freud deprived this objection of its force by a dextrous turn of the artist's hand, which became necessary at the point he had reached; he enlarged the whole conception of sexuality, and 'Libido' for him became practically the manifestation of any pleasureable desire. The extension of the Freudian domain to cover the normal child necessarily led on to the inclusion of the normal adult and all his activities." Here again there is a failure to define the meaning of terms.

Reproduction occurs ere sex; and both sex and reproduction are evolutions from the nutritive impulse, hence in the child the condition is not a complex one, but an incoherent, undifferentiated homogeneity. The term polymorphous perverse applied to the child becomes absurd. Neither sadism nor masochism can separately exist from homosexuality or hetero-sexuality; either state must be present to inflict or suffer pain. That sadism and masochism had their origin in hunger long ere the sex period occurred, has been repeatedly pointed out by biologists.* They are hence potentialities which are present in teratologic or degenerate states not actuated in the child's mental make-up. Sex indifferentism, in which surroundings may create homosexuality, is not homosexuality, any more than intra-uterine organ sex indifferentism implies doubly functioning organs or psychic hermaphrodism. To develop homosexuality a defective constitution or a bad intrauterine environment, or a bad extra uterine environment ere puberty, is needed for the essential factor of the etiologic moment. A latent potentiality is not developed, but a normal tendency is arrested. The psychologic basis which Freud transmogrified into sex was pointed out by Ribot, who remarks:

"In every sane person there is almost always one dominant thought which controls his conduct—the thought of pleasure, money, ambition, his soul's salvation and the like. This fixed idea, which persists through life, save where it is superseded by some other, finally becomes a fixed passion, which proves that attention and all its modes depend upon affective states. The transformation of attention into a fixed idea is still more clearly seen in great men. 'What is a great life?' asks Alfred de la Vigne. 'A thought of youth realized in mature years.' If men in mass be observed—not persons of trained and cultivated minds, as psychologists almost always do—it will readily be seen that spontaneous, and above all, voluntary attention, are exceptionally states. Eliminate first the routine of life—the vast mass of habits which makes us act like automatons, with vague and intermittent states of consciousness—eliminate those periods of our mental life in which we are passive, because the order and succession of our states of consciousness come from us from without and the series of states is imposed upon us in reading a book of average interest, or work manually or otherwise presupposing a succession of acts in a set order. Eliminate the state of relative repose wherein one is thinking of nothing at all—that is, wherein the states of consciousness have neither intensity nor clear definition—as reverie in all its degrees; eliminate states of passion and strong agitations with their irregular fluctuations and their diffusion of movement. These, and perhaps a few other states, eliminated, what remains may be credited to the general account of attention; and in this general account the cases of spontaneous attention constitute the great majority of the entries, while the clear and indisputable cases of voluntary attention are few: with many men they hardly amount to anything." What Freud calls the sex wish content of dream is a very limited phase of this.

ABUSE OF SEX STATUTES.

The evils of the statutory regulation of sex crimes which after fixing a maximum penalty deprive the jury of its powers, are well illustrated in a recent case tried in Chicago, which the *Chicago Herald* thus describes:

A few days ago a street car conductor and a saloon-keeper appeared in the

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**Alienist & Neurologist*, 1891, Psychologic Aspects of the Sexual Appetite.

Court of Domestic Relations to answer charges of having contributed to the delinquency of a young girl. The conductor had induced the girl—a mere child in years, although physically mature—to go to the saloon, where she was kept a prisoner over night. As a penalty for this act the conductor was fined $100 and costs, while the saloon-keeper was assessed $25. Concerning these facts a reader of the *Herald* observes acutely: "It seems to be at least clear that girlhood and womanhood are much too cheaply held when a girl can be taken possession of by anybody who pleases and held a prisoner for one night—for the small sum of $100! Either the law or the court is at fault."

That not unnatural conclusion is strengthened by the testimony of the state's attorney's office. The young girl in question is a member of an honorable family. Until this experience her own reputation was untouched. Yet while she is still a child her degradation has been safely consummated and her violation lightly esteemed.

Surely, the community owes better protection than this to developing womanhood.

The trouble with all such laws is their evasion of the constitutional right to the presumption of innocence. The attempt is made to give a minor punishment to a man whose guilt the state cannot prove except by a scientifically absurd and constitutionally illegal definition. As false accusations of all sexual offences are frequent the male requires protection as much as the female by the law. In the very week when this case was tried there were four false abduction and assault charges dismissed as being "weird stories by Chicago hysterics." The true way to check sex crimes is to define them scientifically, then to make a maximum and minimum punishment, and make, as in Illinois, the jury the judges of the law and the evidence in ordinary criminal cases. "Contributing to delinquency," if really pandering or rape, is a serious antisocial offence. The evidence of it in each case should be left to the jury, which would not fail to give the full penalty where clearly proven. Indeterminate sentences from fifteen years to life are needed to protect society, but these would be felonies. Where there was doubt the blunder of the jury could be remedied under constitutional law. In making them misdemeanors, so as to secure conviction of the innocent and inadequate punishment of the guilty, the state statutory grist mill has become a fertile source of abuses. The acceptance of a minor plea by the prosecution should also be checked. Here disorderly conduct is too often accepted to save the prosecutor's time where serious antisocial crime is committed.

ERRATA.

In the review of Dream Psychology by Dr. Maurice Nicoll, appearing in the January issue, the last line on page eighty-three, read protective for "protestive."

SELECTIONS.

CLINICAL NEUROLOGY.

THE BLOOD AND CEREBROSPINAL FLUID IN THREE HUNDRED KNOWN CASES OF SYPHILIS.—Dennie and Smith, *Am. Journ. of Syphilis*, January, 1918, study the findings in three hundred cases of syphilis—one hundred cases of early and two hundred cases of late syphilis—in which the four standard reactions were used, viz., the Wassermann test on both the blood and cerebrospinal fluid (in a great number the alcoholic and cholestrin reinforced antigens were used), the cell count in the cerebrospinal fluid, the globulin test (Noguchi, which was the most successful in their hands), and Lange colloidal gold test.

Regarding the origin of the syphilitic antibodies in the cerebrospinal fluid, i. e., whether they pass through the meninges from the blood stream or whether the central nervous system itself forms these bodies when it is attacked by syphilis, the authors believe both views are probably correct. In old cases of syphilis with strongly positive Wassermanns on the blood and no symptoms or signs of central nervous system involvement, positive Wassermanns can be secured on the cerebrospinal fluid if 1 c.c. or more are used. Bohan has called attention to this phenomenon. This can be accounted for by the fact that the patient has carried a positive blood Wassermann for years, and during this time there has been a slow filtration of syphilitic amboceptor through the meninges. But in cases of syphilitic disease of the central nervous system an altogether different condition exists. Where the disease is active, a strongly positive Wassermann is always secured with small amounts of cerebrospinal fluid, when the blood Wassermann may be negative even if large amounts of serum are used, this would seem to indicate that the central nervous system itself was a factor in the production of syphilitic antibodes.

The examination of the cerebrospinal fluid of syphilitics with central nervous system involvement gives a clear idea of the activity of the disease. When all the findings are strongly positive, the disease is very active and also very extensive. The cell count alone is an index to the activity of the disease. Thus a patient with a positive four plus Wassermann on the blood and cerebrospinal fluid (small amounts being used), a cell count of three hundred, the so-called paretic curve with Lange's test, and marked globulin is not necessarily a paretic. These findings are simply an indication of the activity of the disease and the patient may have either cerebrospinal meningitis (syphilitic), tabes, transverse myelitis, late secondary syphilis with meningeal involvement, or paresis. Cases of central nervous system syphilis of long standing will often show very indefinite findings in the cerebrospinal fluid. A typical example is one with a negative spinal fluid Wassermann, a negative cell count, one plus globulin, and a syphilitic curve in the gold solution. This simply means that the activity of the disease is almost at a standstill. There are all variations between these two classes.

It will be noted that a great number of the old cases of syphilis without apparent disease of the central nervous system will show positive globulins, a syphilitic curve with Lange's test and a negative cell count and a negative Wassermann reaction unless large amounts of fluid are used. We do not believe that these findings are indicative of central nervous system involvement, but are to be interpreted as confirmatory evidence of syphilis.

The following conclusions are formulated:

1. In primary syphilis, the cerebrospinal fluid was entirely negative in 80 per cent of the cases and of the remaining 20 per cent the findings were very mild.

2. In secondary syphilis, the cerebrospinal fluid was entirely negative in 45 per cent; 35 per cent had mild reactions, and 20 per cent marked findings.

3. In late secondary syphilis, the blood Wassermanns were 100 per cent positive; 60 per cent gave undoubted evidence of meningeal involvement, as the cerebrospinal fluid in these cases was markedly positive throughout; 33 per cent had moderate findings in the cerebrospinal fluids; and only 7 per cent had entirely negative cerebrospinal fluids.

4. Early treated syphilis should have an examination of the cerebrospinal fluid before the treatment is finished, as 50 per cent of the series reported here had positive findings in the cerebrospinal fluid without signs or symptoms of central nervous system involvement.

5. Cerebrospinal meningitis (syphilitic, acute) had the same findings in the cerebrospinal fluid, even to the paretic curve with the gold solution as paresis.

6. Gummata of the penis did not have marked findings in the cerebrospinal fluid, but the confirmatory type.

7. The phagedenic ulcers reported here were evidently due to late syphilis.

8. Old syphilis without symptoms, treated and untreated, have almost the same findings in the blood and cerebrospinal fluid. One-third show confirmatory evidence of syphilis in the cerebrospinal fluid.

9. Syphilis of the tongue, stomach and liver did not show any evidence of syphilis in the cerebrospinal fluid.

10. The larger percentage of syphilis of the bones and joints shows confirmatory evidence of lues in the cerebrospinal fluid.

11. Fifty per cent of the cases with syphilis of the skin (old) showed marked evidence of syphilis in the cerebrospinal fluid. This report is decidedly against the old teaching.

12. Raynaud's disease should always be investigated for old syphilis.

13. Congenital syphilis did not show many positive cerebrospinal fluids.

14. Syphilis of the arteries (aortitis, aneurysm) all showed positive cerebrospinal fluids.

15. Patients with optic atrophy all had positive cerebrospinal fluids (evidence of a meningeal involvement).

16. Brain syphilis of the vascular type had mild findings in the cerebrospinal fluid. The chronic basilar meningitic type had marked findings in the cerebrospinal fluid.

17. In cerebrospinal meningitis (old) without signs, 64 per cent had marked findings in the cerebrospinal fluid and 28 mild findings; the rest were negative.

18. In paresis all the findings were marked.

19. Transverse myelitis, multiple sclerosis, and progressive muscular atrophy should always be investigated for syphilis.

20. Tabes dorsalis was divided into five groups: (1) Marked findings in both blood and cerebrospinal fluid. (2) Positive blood and mild findings in the fluid. (3) Positive blood and negative spinal fluid. (4) Negative blood and positive spinal fluid, and those showing the paretic curve.

21. The intensity of the serologic findings is an index to the activity of the syphilis.

22. The so-called paretic curve may occur in any Lange test, no matter what type of activity, if the process is very active.

Variations in the Lateral Processes of the Fifth Lumbar Vertebra in the Etiology of Backache.—H. Augustus Wilson, *West Virginia Med. Journ.*, believes backache whether localized or diffuse is variously interpreted by the patient and by the bias of the physician. The patient's description of the pain is often misleading, depending upon his susceptibility and sensitiveness. The sharp acute pain of one person is an ache or a dull throbbing pain to another. One will hear that agonizing pain exists that is unendurable, but the surgeon is not able to demonstrate it by palpation, forced postures or firm pressure. It would seem, therefore, that pain alone is of doubtful value and possesses importance only when associated with symptoms and signs that correlate and are demonstrable.

The term backache is associated with so-called rheumatism, sacroiliac sprain or relaxation, neurasthenic spine, static backache, visceroptosis, irritable, or railroad, spine, coccygodynia, sciatica, uterine disease and displacement, appendicitis, cystitis, scoliosis, osteo-arthritis, lumbago, occupation backache, cholecystitis and many other conditions.

There are many causes of backache, with only one of which this paper dwells. The pain associated with impinging of the lateral process of the fifth lumbar vetebra with the brim of the ilium or with the sacrum is generally distinctly localized over the point involved. It is most frequently localized by the patient placing a single finger rather than the whole hand upon the painful spot.

The onset is most apt to be sudden, following wrench or other trauma; the pain is persistent in certain postures with freedom or lessening in other postures. Ofttimes the onset is gradual, at first occurring after assuming a position of the body best described as leaning backward, a position that increases the normal physiologic lumbar curve. There are at times also radiating pains or diffuse pains associated with it, often depending upon the character of the patient.

The fifth lumber nerve forming a part of the cauda equina passes out from the spinal canal through the intervertebral foramina between the fifth lumbar vertebra and the sacrum. The anterior portion of the lumbosacral cord helps to form the tibial and the peroneal nerves. The fifth lumbar nerve supplies sensory fibres to the outside and back of the leg, to the inside of the dorsum of the foot, to portions of the great toe and the two toes next to it. It also carries motor fibers to the three gluteii, both heads of the biceps, both hamstring muscles and a number of muscles in the leg. Oppenheim has directed attention to the frequency with which injury affects the sciatic nerve in the pelvis as shown in paralytic symptoms of the peroneal nerve.

It is analogous to the various reports of a patient when the ulnar nerve is pressed upon at the elbow. There is, in addition to the localized pain at the elbow, a tingling sensation at the fingers, or a numbness is often spoken of. In like manner the contact of the lateral process of the fifth lumbar vetebra with the rim of the pelvis has associated with it what is described as sciatic pains or cystitis, or the abdominal pain varies as greatly as the pain of appendicitis, gall bladder or ovarian irregularities.

With accumulating records of the great variety of shapes and sizes of the lateral processes of the fifth lumbar vertebra it is important to study a large group in order to determine a standard. Too much reliance should not be placed upon anatomical irregularities as shown by the radiograph, for it has many times been demonstrated that the relative position of the lateral process depends upon the position of the tube when the X-ray is taken. Of three radiographs taken of the same patient on the same day by the same Rœntgenologist, the first was taken with the tube directly over the lateral process, and showed an appreciable contact of one lateral process with the sacrum. The second was taken with the tube about four inches above the first, and showed an extensive overlapping. The third was taken four inches lower than the first, and demonstrated a wide space between the bones. Therefore it is important that interpretatior of X-ray plates by the clinician should be based upon information furnished by the Radiographer, or better still, by a combined study, thus embracing the clinical phenomena and the radiographic findings.

It therefore follows that given a patient with backache, distinctly localized pain as well as radiating pains down the legs and feet, radiographic findings of impinging lateral process of the fifth lumbar vertebra, a cure is possible by operative excision in less than thirty per cent; an improvement may be obtained in sixty-five per cent, while a worse condition than the original painful back may result in an undetermined number of patients.

It must be recognized that occupation, posture or, in other words, static conditions are the most frequent etiologic factors of backache even when an impinging lateral process is demonstrable by radiography.

An attempt has been made to determine what is the normal shape and position of the lateral process of the fifth lumbar vertebra, and especially its relation to the ilium as well as its bearing upon backache. Fifty-one patients with backache of various forms were radiographed and studied. The X-ray plates were all taken with the patient flat upon the back on a straight hard table. A great variety of shapes was demonstrated and great irregularity was found as to their relations with the ilia. It was frequently observed that where the overlapping was the most conspicuous there was the greatest lack of corroborative symptoms. It is proper to accept the established fact that there are not two noses alike or two eyes alike, so the dissimilarity is observable in various anatomical structures as well as in their relations to each other.

It is fair to assume that the existing conditions and relations of the lateral processes of the fifth lumbar vertebra are normal to that individual patient. That occupation or injury may bring that part into prominence, and that it will then become conspicuous —not as an abnormality—not as something to be excised, but something that indicates the avoidance of those conditions that brought it into prominence. If pathologically involved the etiological factors must be removed.

The following conclusions are recorded:

1. The lateral processes of the fifth lumbar vertebra become etiological factors in backache, (a) when they are involved in a pathological process, (b) when associated with bursa, (c) when forced into contact with the sacrum or the ilium, (d) when occupation induces a static condition.
2. Radiographic plates alone are apt to be misleading.
3. Unsupported clinical evidence cannot be convincing and conclusive.
4. A positive diagnosis depends upon an analysis of all obtainable facts.
5. The anatomical variations contraindicate any fixed standard as to size or shape.
6. Therapeutic measures either palliative or radical depend upon the cause.

THE TREATMENT OF EARLY SYPHILIS IN RELATION TO THE DEVELOPMENT OF NEUROSYPHILIS.—Lowrey, *Am. Journ. of Syphilis*, January, 1918, records several cases, from which he draws the following conclusions:

Thorough, early treatment is not a guarantee against later paresis. The time interval between infection and development of paresis is not especially modified by the usual treatment. Whether due to special invasive powers, lack of resistance in the nervous system, or drug-fastness of the organism, the fact remains that there are cases in which the most vigorous treatment fails to prevent the development of paresis, or even to delay it.

Patients in the secondary stages should be punctured, and treatment modified according to spinal fluid findings. If not all patients, then certainly all early syphilitics with headache or any nervous or mental symptoms, should be punctured.

If intensive treatment will improve the patient who has developed paresis, then intensive treatment of the same type months or years before, guided by spinal fluid findings, should go far towards preventing the later development of paresis.

MADNESS AND UNSOUNDNESS OF MIND.—Charles A. Mercier, *Journ. of Mental Science*, October, 1917, reiterates and emphasizes the doctrine which he first promulgated more than a quarter of a century ago, that madness and unsoundness of mind are not the same thing; that madness includes more than unsoundness of mind, and that unsoundness of mind very often occurs in the sane, indeed is one of the most frequent disorders of the sane.

The author contends that insanity is primarily disorder of conduct, and that this view of insanity is the greatest advance that has been made in our contemplation of insanity since it ceased to be regarded as demoniacal possession, and came to be looked upon as disorder of mind.

Insanity is disorder of mind—in part. Disorder of mind enters into the concept of insanity, but it is not the whole of the concept nor the most important part of the concept. Disorder of brain-function is another part of the concept, but first and foremost comes disorder of conduct; and for this reason that conduct and disorder of conduct can be directly observed. We can see it or hear it. It is made evident to our senses. Disorder of brain function cannot be directly observed. Disorder of mind cannot be directly observed. They can neither be seen, nor be heard, nor be felt. They are completely hidden from observation. In as far as they exist in madness they can only be inferred, and inferred from the observation of conduct; that is to say, of what a man says and the way he acts.

The author asserts on the contrary—and this is the second part of his thesis—that there are many disorders of mind that are quite compatible with sanity, that often occur in the sane without compromising their sanity in the least, and that no one would or could consider insane. Hallucination is disorder of mind; and if hallucinations may occur in the sane, and it is common knowledge that they do, then disorder of mind may occur in the sane, and this disproves the doctrine that madness is the same thing as disorder of mind. Among the hallucinations of hearing, which are common both to the sane and the insane, is tinnitus. Tinnitus is not usually considered to be hallucination, but unquestionably it is so. If the hearing of voices when there are no voices to hear, no sound-waves impinging on the tympana, is hallucination, then the hearing of musical notes or of blowing off steam when there are no musical notes or there is no blowing off of steam to hear, is equally hallucination, though it is very doubtful whether there is any true hallucination of hearing. In hallucination of hearing there are impressions on the auditory nerve coming either from without or from within the body; but these impressions are misinterpreted. In that case they would not be hallucinations, but illusions. But what we call them does not matter. In any case, they are sensations received and interpreted by the mind, and the erroneous imagination or misinterpretation, it does not matter which, is disorderly action of the mind. Aurists speak of noises in the ears; but alienists know, or ought to know, better. The noise is not in the ears, but in the mind, just as the blue color of the sky is not in the sky, but in the mind. Tinnitus, then, is disorder of the mind; and does tinnitus never occur in the sane? Is this disorder of mind the same thing as madness? If disorder of mind is insanity, then tinnitus is insanity. From this conclusion there is no escape. It cannot be denied; it cannot be controverted; it cannot be disputed.

Whatever the state of a person's mind may be, he is not considered mad if he behaves in every respect like a sane person; and if he behaves as a madman, he is mad, whatever the state of his mind may be. It is behavior, it is conduct that we go by. And behavior can be directly observed. We are to put in our certificates facts observed by ourselves, and the only facts we can observe are facts of conduct or behavior. We cannot see or hear the delusion in another person's mind; all we can see or hear is the expression of it in speech or gesture or some other mode of conduct.

MENINGITIS SYMPATHICA.—Israel Strauss, *Am. Journ. Med. Sc.*, 1917, CLIV. 748, says that meningitis sympathica is a condition of the cerebrospinal fluid caused by inflammation in the neighborhood of the meninges. It is characterized by an increase in the pressure of the fluid, an increase in globulin and cellular elements, sterility of the fluid, and symptoms of meningitis. These cells are usually mostly polynuclears, but lymphocytes may predominate.

The condition occurs most frequently in abscess of the brain, especially those secondary to infection of the middle ear, mastoid cells, or sinuses. Examination of the spinal fluid in such infections will give a clue to the possible extension of the infection to the brain and the need of examining the condition of the lateral sinuses and dura on operation.

It may be difficult to distinguish meningitis sympathica from tuberculous or other form of meningitis when organisms of these conditions cannot be found. An old subarachnoid hemorrhage usually gives an increase of cells, mostly lymphocytes, in the spinal fluid, but the peculiar yellowish tinge of the fluid shows the origin of the cell content.—*Cleveland Med. Journ.*

THE VALUE OF DIAGNOSIS IN BACK LESIONS.—J. W. Seever, *Boston Med. & Surg. Journ.*, 1917, CLXVII, 857, states that compression fractures of the spine are generally due to extreme flexion of the spine, as in falling some distance on the back or feet. There is usually no nerve involvement nor symptoms of pressure on the cord. The injury results in a weak, stiff and painful back, with tenderness over the site of the fracture. Diagnosed as simple strain, with proper treatment neglected, after a period of complete disability these patients are able to be up and about, but are not able to do heavy work. The examination of any back case is incomplete without a good X-ray. There is usually a kyphos present, but not always appearing at once. The treatment should consist in adequate fixation of the spine, in plaster at first, later by means of a brace. The whole period of treatment will probably cover a period of several years. Bone grafting may shorten this time, but enough data have not as yet been collected in order to prove this procedure to be routinely desirable. A workman with such an injury will probably never be able to do heavy work again. And the sooner he is given light work the better for him, his employer and for the insurance company.—*Cleveland Med. Journ.*

ASTHMA.—R. H. Brown, *Illinois Med. Journ.*, November, 1917, from an extensive research of the literature, reaches the following conclusions:

Asthmatic paroxysms are of the nature of anaphylactic attacks.

The underlying cause is sensitization of the system by absorption of proteid toxins from bowels or retained secretions in nose or elsewhere.

The exciting cause is the inhalation or ingestion of this protein poison when the system is so sensitized.

Nasal irregularities may tend to focus a toxemic attack in the respiratory tract which might otherwise show in other manner.

Thorough treatment of nasal disease or abnormality, with scientific attention to bowel toxemia, cures or prevents the great majority of cases.

A PLEA FOR THE INTENSIVE TREATMENT OF NERVOUS DISEASES.—Booth, *Ill. Med. Journ.*, February, 1918, expresses the conviction that the prognosis of nervous diseases is more favorable than generally recognized, and discusses some of the principal causes of failure in their treatment.

For purposes of elucidation the subject is subdivided into the following headings: 1. Characteristics; 2. Procrastination; 3. Indifference; 4. Self-medication, and 5. Intensive Treatment.

The author attempts to show improvement is usually slow and eventful, and why treatment necessary for a full restoration is usually prolonged. He emphasizes the necessity for the physician to impress the patient with the nature of his ailment, the obstacles to be overcome, the rationale of treatment, the object of medication with its benignity under professional supervision, the importance of discarding all other advice and strictly follow the instructions of the attendant, who must have a knowledge of the physiological and therapeutic action of the drugs used, as well as the knowledge and experience necessary to recognize when they are indicated.

Referring to the fear often expressed by physicians and patients, regarding the use of hypnotics, the author writes:

"He who cannot properly wield the knife or fears the possible danger from the ignorant or unskillful use of it, obviously should not use it; neither should he jeopardize life or limb by using less radical treatment when the knife is clearly indicated and may safely be used by the competent operator; nor should one for the same reason discourage the patient from having the knife used by one who is capable of using it, and thus deprive the patient of a safe, speedy and permanent recovery."

Because people recover without active medication and occasionally in mild cases without medical treatment, is a poor argument against energetic treatment in all cases, since active treatment will not only abridge the period of recovery and cause it to be less eventful in all cases, but will prevent the disease becoming more "fixed" and diminish the possibility of the development of complications or acute diseases to which patients by reason of the accompanying debility are more prone.

Failure is more often due to the improper or unskillful use of the correct remedies than to the use of the wrong ones; in other words, failure is more often due to the misuse, than to the disuse, of the correct remedies.

ON THE DEVELOPMENT OF THE NERVOUS SYSTEM DURING INFANCY. CONTRIBUTION TO THE STUDY OF SYNCINESIES, TENDON AND CUTANEOUS REFLEXES AND THE REFLEXES OF DEFENSE.—Mlle. S. Rosenblum (Thèse de Paris, 1915), *Revue Neurologique*, 1917, XXIV, 176, mentions the fact that at birth the infant shows an incomplete development of the pyramidal tracts, which definitely disappears about the age of three, when the nervous system reaches perfection. The condition is indicated by many signs in regard to the reflexes.

The deep reflexes of the lower extremities are exaggerated, especially the knee-jerks. Frequently the consensual reflexes are obtained. The ankle-jerks are always present, but less active than the knee-jerks. One can attribute to a fault of technique the absence of the Achilles reflex except in infants suffering from extreme malnutrition.

The plantar reflex is generally in extension, although there are cases in which one observes a frank flexion even in early infancy. After the age of three and one-half years the extension response ought to be considered as pathological. The extension of the great toe may be accompanied by either spreading or flexion of the other toes. The reflex often occurs spontaneously in early infancy. Oppenheim is usually present.

The defense reflexes are always present in the new-born. They disappear earlier than the Babinski, occurring most prominently during the first six months, and rarely after the first year. The defense reflexes persist in cases of motor debility in which the evidences of insufficiency of the pyramidal tracts are very marked.

Syncinesis and paratonia complete the special syndrome indicating the incomplete development of the nervous system in infancy.

Paratonia and syncinesis usually disappear in the first month, although it is observed up to three years in marked debility.—*Cleveland Med. Journ.*

HYSTERO-TRAUMATISM WITH SO-CALLED "PHYSIOPATHIC" SYNDROME CURED BY RE-EDUCATION (HYSTERO-TRAUMATISME AVEC SYNDROME DIT "PHYSIO-PATHIQUE" GUERI PAR LA REEDUCATION).—Dr. Jean Ferrand, *Le Pregres Medical*, March 10, 1918, writes that attempts have been made to classify the numerous forms of paralysis resulting from wounds in battle. Some are due to direct lesions of peripheral nerves and their roots: others are hystero-traumatic in nature. Between these two extreme varieties there is a particular clinical type which must be isolated from others—paralysis of reflex origin.

Certain neurologists describe a form of paralysis characterized by special trophic, vaso-motor, electric, and reflex troubles in the paralyzed limb, such phenomena being sufficient in their eyes to prove the organic origin of the paralysis, which explains their therapeutic failures. They infer from this the uselessness of, even herioc, psychotherapeutic measures. This inference would seem to be somewhat premature, as observations on a case in point go to prove the contrary. It was that of an infantry soldier who, in May, 1915, was wounded in the right calf. Healing followed a normal course, and was completed in a few weeks. During convalescence he began to walk badly owing to alleged pain in the limb, which assumed the position of equinus with contracted Achilles tendon. A surgeon, believing that the lesion was really organic, severed the tendon, restoring mobility to the foot, which could now be easily placed flat on the ground. He could, however, walk no better after the operation, and, although the equine phenomenon could no longer be produced, owing to section of the tendon, the leg assumed another vicious position, being semi-flexed on the thigh, with immobilization of the knee-joint. He could only barely put his foot to the ground, and was extremely lame, walking with the help of a crutch. Again a surgeon, never suspecting a neuropathic affection in the case of a wounded man, did a tenotomy of the flexor tendons of the leg, putting it up in a plaster apparatus to maintain extension of the limb. The result was satisfactory only to a slight extent, but he walked without a crutch when he was sent to a neurologic center in December, 1916.

He walked with two sticks, the right leg in a position of forced extension on the thigh, and flexion was impossible. The first care was to seek for evidence of a lesion of the terminal branches of the sciatic, and especially of the internal popliteal branch. There was no true motor paralysis, but relative weakness of all active movements. All passive ones were possible except flexion of the knee. There was no sensory trouble; and all the reflexes were normal, a little stronger perhaps on the affected side. Trophic troubles were very marked. All the distal part of the leg was edematous, cyanosed, almost a violet tint, very cold as compared with the sound limb. The skin was thin, attenuated, and the toes crossed each other to some extent. In the whole foot and lower third of the leg there was well-marked muscular hyperexcitability. The slightest tap on the muscles brought on violent contractions, and even dissociation of movements which are not usually independent in action, such as adduction of the great toe, or abduction of the little one. In a word, the case presented all the troubles attributed to reflex contractures or to the phenomena called "physiopathic."

The mental state was peculiar. A working miner, he weeps at the least examination, manifests absolute terror at the slightest touch of his affected leg, and tremblingly implores one to cure him.

To sum up: here was a wounded patient with a paralyzed limb and contraction of the knee, who presented all the signs of the paralyses called "reflex," who has been subjected to a series of tentative therapeutic measures which have failed: a characteristic type.

As to treatment, the patient was brought into our re-education ward, and after having been for a considerable time subjected to fatigue by more or less violent physical exercises, the contracture was, as it were, brutally overcome. After half an hour of passive movements of flexion and extension of the leg, and after showing him how he could bend and straighten his limb, he was induced to do this voluntarily. These active movements were aided and sometimes provoked by galvanic stimulation of painful intensity. In the end he was able to walk slowly, while he bent both knees fully, and, after a treatment lasting about two and a half hours, he was cured.

The case was a particularly bad one, for surgical immobilization had caused intra-articular adhesions in the knee which it was necessary to rupture. A slight amount of hydrarthrosis followed next morning, but a few days later he walked like any normal person.

This, though a remarkable case, is not a solitary instance of the kind, and Dr. Ferrand has published the general result of his researches on the subject. The clinical type which has been sought to be created does not seem sufficiently differentiated. We need only cite in proof the successive denominations which have been given it. The term "reflex contracture" assumes a condition which very often does not exist, for there is flaccidity in many of these paralyses. Moreover, the term "reflex" implies a pathogenic idea, which is already abandoned by the creators of the clinical type. It has been designated a "physiopathic disorder," a term which is not very precise, and has hardly more significance than the old term "functional." In the minds of the authors this term "physiopathic" would imply the idea of an organic lesion, or at least one not functional in character. And the syndrome thus created is, in their descriptions, opposed not to an organic, but to an hysterical syndrome. In this view Dr. Ferrand cannot share.

He concludes his article with the following summary:

(1) Physiopathic symptoms exist, but they do not constitute an independent clinical syndrome. Many patients presenting these special symptoms, separate or combined, are cases of organic affections with lesions of peripheral nerves; moreover, direct and not reflex.

(2) There is but little relation between the reflex lesions described by Charcot as occurring in chronic arthritic cases and post-traumatic lesions. These latter are, moreover, described by him also amongst the hystero-traumatisms.

(3) The symptoms are not completely new.

(4) They are to be found to-day in many wounded who do not present any organic lesion, but merely ordinary hystero-traumatisms.

(5) They do not constitute any contra-indication to psycho-therapeutic treatment, even of an heroic kind, and these patients are cured as well as others. In any case, from the fact of a failure of cure it is not to be inferred that they are not the subjects of hystero-traumatism; for some succeed where others have failed, of which the patient whose case has been recorded is an example.

(6) From a medical and military point of view, such patients (when they have not been attacked with organic affections) should be considered and treated as cases of hystero-traumatism. It would be dangerous to make them out to be organically diseased or to treat them as such, for the contagion of example would make ravages in neurological centers.

(7) To cure these patients we must employ all the most energetic means which the authorities have placed at our disposal, from moral suasion to the most painful electric currents. In this way multiple successes are achieved, and the Army recuperated with vigorous subjects.

Such are the conclusions to which Dr. Ferrand and his colleagues have been led by a practice of eighteen months in one of the most important neurological centers in France.—*Jour. of Mental Science.*

POLIOMYELITIS FROM THE STANDPOINT OF THE NEUROLOGIST.—Ball, *St. Paul Med. Jour.*, August, 1917, discussing this subject, lays special stress upon the abortive and atypical forms as an important factor in spreading the disease. The writer states that this type is thought, at present, to constitute a large percentage, variously estimated at from 35 per cent. to 50 per cent., of the total number of cases. The infectious nature of this form is regarded equally as great as, if not greater than, those forms in which paralysis develops.

The onset of the abortive type begins with a disturbance of the respiratory, or digestive tracts, or of both. There is fever, malaise, headache, vomiting, drowsiness, twitching of the muscles, rigidity of the neck, general hypersensitiveness, pulse rapid out of proportion to the fever, sometimes profuse sweating, an exquisite tenderness to pressure along the nerve trunks, hyperactive reflexes, and Brudzinski's and McEwen's signs. All of these symptoms are not present in every case and there are variations in the clinical picture, just as occur in the course of other infections. Nevertheless, the type is distinctive and should not be difficult of recognition during an epidemic. In doubtful cases, lumbar puncture will aid in establishing the diagnosis.

The pathological processes in poliomyelitis may extend in a diffuse and disseminated manner throughout the nervous system, hence an involvement of the neuron of the first order is one of the possibilities, consequently there is nothing incompatible in the diagnosis of infantile paralysis in a case which has a spastic paralysis and an active reflex. We must eradicate the old ideas that all paralysis in poliomyelitis is of a flaccid character, with absent reflexes; also, that every case of the disease develops paralysis. There are many cases of the meningeal type in which no paralysis occurs.

Cases have been reported where Babinski's sign and Oppenheim's phenomenon were present.

The examination of the reflexes is not always easy and serious diagnostic errors, as the result of false interpretations of the responses obtained, are often made. The failure of a patient to properly relax his muscles is sometimes responsible for the failure to obtain the reflex; a strained position of the body in bed may cause the reflex to respond on one side and to appear absent on the other. Such conditions are especially apt to be encountered in children because they place themselves on the defensive as soon as one starts to examine them.

It is necessary to test for the Achilles reflex in every case.

The bulbo-spinal form is well illustrated in the ascending or Landry's paralysis type. In this form the paralysis begins in the lower extremities and rapidly ascends, until in the course of several days the medulla is reached, and the patient dies from a paralysis of the respiratory center. The bladder and rectum are often paralyzed. Sometimes sensation for all qualities is lost as high as the level of the motor paralysis and except for its ascending character the case resembles a transverse myelitis. It is well to remember that complete loss of sensation for the time being at any rate is another one of the possibilities, sometimes occurring in poliomyelitits. In this type the sensorium is usually uninvolved.

The bulbo-pontine form is identical with the spinal except that the cells of the bulbar nuclei are involved instead of the cells in the anterior horns, causing paralysis of one or more of the cranial nerves, as the facial, auditory, abducens and glossopharyngeal.

In typical cases, with an acute onset, the diagnosis is not difficult. In mild cases, however, where the symptoms are transient in character, the recognition is not so easy. For example, an isolated abducens or facial paralysis, especially in young adults, coming on suddenly, with very slight general symptoms, might easily escape recognition. Under such circumstances, it would be hard to differentiate in the facial paralysis between a Bell's palsy and a poliomyelitis. All such cases, during an epidemic, should be isolated.

The cerebral and meningeal types present symptoms which upset our former conceptions of infantile paralysis more than any of the other forms. They show more of the possibilities in symptoms, and in their recognition, a distinction from other kinds of meningitis, such as cerebro-spinal, septic, and tuberculous, must be made. The symptoms are those of an acute meningitis which may or may not be accompanied by a paralysis. While certain factors, such as the presence of an epidemic of the disease, the acuteness of the onset, etc., may help in distinguishing this type of meningitis from those due to other causes, nevertheless it is important to recognize that our chief means of differentiation in many cases is to be found only by an examination of the spinal fluid, which is characterized by the small amount of globulin, the marked increase in the number of cells, the large number of lymphocytes, the large mononuclear cells and the slight reaction of the Goldsol test.

In cerebro-spinal and septic types of meningitis, the cloudiness of the fluid, the different character of the cells, leucocytes instead of lymphocytes, the absence of the large mononuclear cells, the reaction of the Goldsol in the higher dilutions, the so-called meningitis zone, and the growth in the culture tube after a few hours, make the distinction easy.

In tuberculous meningitis, with a marked increase in the cell count, one expects to find a proportionate increase in the globulin, a much more marked reaction of the Goldsol occurring in the meningitis zone, the absence of the large mononuclear cells and, especially in cases running a very acute course, the finding of the tubercle bacilli.

While spastic paralyses are not the usual type found in poliomyelitits, we must remember they do occur and probably more often than we have thought because of our failure in the past of identifying them with this disease. It is quite likely that some of the cases which formerly were enrolled under the cerebral palsies belong here.

HEADACHE DUE TO NASAL DISEASE.—E. D. Putnam, in the *St. Paul Med. Journ.*, December, 1917, writes that headache or pain from nasal affection is variable; it may be constant or periodical; often described as tearing, stabbing, sharp, dull, or a feeling of pressure; is often limited to some particular region, as frontal, between the eyes, behind the eyes, top of head, or back of neck; may be unilateral or bilateral; more frequently unilateral; when very severe there may be an area of skin tenderness.

Neuralgic pains of the face are often due to nasal disease and in nearly every case of facial neuralgia there is some focus of infection existing either in the teeth, the superior maxillary or nasal sinuses.

Headache is the most comon symptom of affection of the nose and its sinuses; and is of great value in arriving at a diagnosis. Many cases of nasal accessory sinus disease go through life with a diagnosis of chronic headache.

There are many varieties of nasal conditions causing headache, viz.:

1. Swelling of the mucosa with pressure of its nerves.
2. Contact of the swollen mucosa.
3. Stasis following obstruction of the drainage passages.
4. Negative pressure in the sinus.
5. Reabsorption of the toxins formed within the sinus.
6. Ulceration of the mucosa involving the nerve supply.

Direct contact of the swollen mucosa, such as pressure upon the septum from turbinal hypertrophies, is a very common cause of headache. These cases are being repeatedly refracted without relief of the pain or examination of the nose.

The author reports a case of pain referred to the region of the orbit, in which the middle turbinate pressed against the septum and also with great force against the lateral nasal wall, removal of which gave lasting relief.

Often such pressure causes pain in the supra-orbital region and down the side of the nose, with perhaps superficial tenderness, simulating frontal sinusitis, but are completely relieved by removal of the anterior end of the middle turbinate.

The author believes headache in the supra-orbital region in chronic cases is more likely to be caused by pressure of a hypertrophied middle turbinate than it is to an inflammation of the frontal sinus.

Periodic headache should suggest sinus disease. If referred to the top of the head or described as a dull, heavy feeling of weight on the head, it suggests a chronic inflammatory condition of the frontal sinus. Pain at the back of the head, back of neck, or deep behind the nose and eyes, suggests chronic inflammation of the sphenoid sinus or posterior ethmoid cells.

Pain and tenderness over the malar bone radiating upward toward the outer canthus, suggests inflammation of the maxillary antrum. Pain through the forehead, through the eyes, or between the eyes with a sense of weight, suggests inflammation of the anterior ethmoid cells.

Severe pain through the temples suggests sphenoid inflammation. Occipital pain sometimes accompanies sphenoidal inflammation.

The foregoing remarks refer mainly to chronic inflammation. The pain accompanying acute sinusitis is more definite. For example: An acutely inflamed antrum is tender directly over the cavity and an acutely inflamed frontal sinus is tender under the brow. Most acute cases do well under medical treatment.

Treatment consists of shrinking the nasal mucosa with tampons of ten per cent. solution of argyrol. This often affords immediate relief from the headache accompanying acute sinusitis. It depletes the inflamed tissues, stimulates ciliary motion, thereby favoring drainage from the passages. The most frequent surgical treatment consists of correcting deflected septa. Operative work upon a diseased sinus is only occasionally required.

The amount of headache in a given case may have very little bearing upon the severity of the nasal lesion. Very severe pain is often found with minor changes, or slight pain with severe cases.

DRUG ADDICTION AND MODERN METHODS FOR ITS CONTROL.—Rubin, in the *Boston Med. & Surg. Journ.*, says that since the federal and state governments have enacted laws prohibiting and penalizing the indiscriminate sale and the habitual use of narcotic drugs, the question of cause and the control of drug addiction came to the foreground.

The conspicuous activity of local police and federal authorities has overshadowed the real nature of the evil by lending to it a criminal aspect, thus branding narcomania with the stigma of crime and prescribing a penalty for the offense.

Laws intended to uproot the evil have been inscribed on the statute books; all of which, though well intentioned, have failed as yet to strike at the core of the trouble.

Although our laws forbid habitual indulgence in and the indiscriminate sale of habit-forming drugs, none provides a remedy other than the penal institution.

Those who come in professional contact with the narcomaniac are convinced that drug addiction is a definite disease having a well-defined symptomatology and an indefinite pathology.

Granting, therefore, that we are dealing with a definite disease, the question of susceptibility, cause, and treatment presents itself for consideration.

The combined researches of the psychologist, the sociologist, the alienist, and the criminologist have not been productive of a satisfactory explanation of why men and women indulge in narcotic drugs. It is said that men drink alcohol and indulge in narcotic drugs because they have an instinctive desire for some form of stimulation, and for the same reason indulge in tea, coffee, and tobacco. Not always are habit-forming drugs used to stimulate sluggish mental faculties or to slow down an overactive mind. In either case, when so used, the element of time and protracted use soon reduces, and ultimately destroys, the efficacy of the drug, both as a stimulant and as a depressant, and the individual takes it thereafter to maintain a normal mental and physical tone. Finding himself in the throes of a permanent habit, the addict uses narcotic drugs as a connecting link to join the break, which his habitual indulgence produced, in the chain of normal mental and physical functions.

The continued gratification of a craving for artificial stimulation establishes in the habitué a vicious circle of disease, poverty, crime, and punishment, each one following the other in sequential order, and reacting upon each other until a break in the continuity of the circle is brought about through abstinence. Abstention brings on a series of mental and physical disorders which require the restraining influence of a normal will power, the lack of which compels the user to resort to drugs in order to obtain relief. Thus the habit becomes deep-rooted, the vicious circle continues to operate, the addict develops into a pathetic figure, and is finally reduced to a state of mental and physical deterioration.

Close observation of alcohol and drug inebriates, before and after treatment, suggests that addicts become such because of an inherent or acquired mental weakness, and that in most cases it antedated their habitual indulgence in habit-forming drugs. In other words, it is the neuropath or psychopath who seeks in narcotic drugs the missing link in his chain of normal functions, the restoration of which makes him feel "just right."

Those who have to treat addicts appreciate the futility of relying wholly on the innumerable pharmaceutical remedies so widely and variedly employed in combating the narcotic-drug habit. Successful treatment does not end with the discharge of the patient from the hospital. The real struggle begins at that stage, and becomes more intense and trying with each succeeding day.

Failure permanently to cure drug addiction is due to three powerful influences which assail the patient after treatment and discharge from the hospital. One, the distressing symptoms of abstinence, which gradually reappear and react upon the patient's power of self-control, destroying the stability of purpose that has been inculcated in the patient during his stay in the hospital; two, his return to the same unchanged social environment, which was probably the original cause of the victim's addiction; three, the patient's inferior mental stamina, which he may have acquired or inherited, but which renders him a prey for any form of stimulant.

Hence, something more than purging, nauseating, depressing, motor-exciting drugs must be resorted to if success in the cure of narcotic-drug addiction is to be attained. To attain the desired end, entirely different forces should be enlisted in the treatment—forces employed by the psychologist, the alienist, the neurologist, and the internist.

Successfully to cure drug addiction, the addict should be treated in a hospital or institution specially constructed to receive such cases. To prevent escapes at the critical period of their treatment, and to provide for temporary close confinement which proper treatment necessitates, suitable and comfortable quarters with good ventilation and plenty of sunlight should be provided. Drug addicts are notoriously unreliable and should be closely watched; their quarters should be frequently searched for smuggled drugs.

For these reasons the addict should be treated in an institution and not at the patient's home, and for no less a period than a year.

The aged user, the paralytic, and others too far gone for treatment, must have their daily supply, which should be furnished through local boards of health.

These suggestions apply only to the social users, of which there are approximately seventy per cent. The criminal and delinquent type, of which there are approximately twenty per cent., are subjects for the penologist and criminologist. This class of users is the most hopeless and the most dangerous element to deal with. They are intractable, cunning, designing, and wholly devoid of moral responsibility.

The penal institution has never cured the drug and alcoholic inebriate. Unfortunately many addicts have been initiated to the use of habit-forming drugs in such institutions, taking it principally for the purpose of creating a euphoria to take the place of the depression which jail walls produce. On his discharge from the penal institution, the addict finds himself without moral fibre or mental strength, the need of which is obvious, if he is to be restored to his normal self.

Unfortunately the Harrison law provides that the addict should be deprived of his supply, but does not provide for his care. In other words, the law drives the addict to employ the very means of procurement which it aims to contravene.

Contrary to the prevailing opinion of the medical profession and the laity, the majority of drug-users have themselves to blame for their addiction. These facts have been gleaned from addicts, approximately seventy per cent. of whom admitted on close questioning that their enslavement in drugs is due to their own manner of loose living and indiscriminate social relations with users. Thus stands the medical profession as a whole exonerated from the oft-repeated charge that its members are responsible for the widespread addiction among men and women. In this respect it may be said that as a general rule an addict's confession or admission is to be regarded with suspicion, and should be relied upon only when corroborated by others in whom confidence can be reposed. But when an adict places the responsibility of his folly upon himself, accepting whatever disposition his examiner will make of him, his statement may be regarded as true.

Unfortunately the medical profession does harbor unscrupulous physicians who have undoubtedly done much to further the spread of the evil. These men are responsible for the general accusation against the profession in this as in other things.

In the interest of the seventy per cent. of social users of narcotic-drugs, which constitute the desirable class for institutional treatment, our legislatures should be urged to provide suitable and adequate facilities for their proper care along modern and rational lines, that they may be restored again to useful citizenship and to society.

EXPERIMENTAL NEUROLOGY.

NEUTRALIZATION OF VIRUS OF POLIOMYELITIS BY NASAL WASHINGS.—H. L. Amoss and E. Taylor, *Vermont Medicine*, August 11, 1917, made tests to determine the effect of concentration of washings on the activity of the virus. Amounts of virus which would certainly produce the infection if injected directly were added to a filtered washing fluid obtained from persons not having been exposed to the infection. The mixtures were separately reduced to small volume in vacuo at low temperatures and injected into monkeys. The results obtained were variable, for reasons which at first were not obvious, but the tests nevertheless showed that the filtered virus in certain amounts may withstand concentration in washing fluids without losing entirely its infective power. The naso-pharynx was rinsed with double distilled water and the washings were fractionally sterilized by heating to 60 C. for three successive days. Each person's specimen was handled separately. The virus employed was obtained by filtering a 5 per cent. suspension of glycerolated poliomyelitic monkey spinal cord. To each 30 c.c. of the washings 7.5 c.c. of the filtered virus were added. The mixture was then incubated at 37 C. for twenty-four hours. Control mixtures of virus and distilled water were subjected to the same incubation. Each cubic centimeter of the mixtures then contained 0.2 c.c. of the filtrate, or at least two minimum lethal doses of the virus.

The results of this experiment suggest that the nasal washings of a person suffering from acute poliomyelitis may exercise no restraining influence on an active virus, while those from healthy persons, under identical conditions of preparation, inhibit its activity. The secretions of apparently normal persons vary in the so-called neutralizing power. In each series of experiments the potency of the virus was established by control experiments. The secretions of three persons out of six examined varied in their power to neutralize 0.2 c.c. of the virus filtrate at different times under nearly identical conditions, yet the only known clinical differences consisted in the presence of a rhinitis which appears to remove the inactivating power of the secretions.

The neutralizing substance is apparently rendered inactive by heating to 70 C. Apparently inflammatory conditions of the upper air passages tend to remove or diminish the power of neutralization. But irregularities have been noted, even in the absence of these conditions. The neutralizing substance is water soluble and appears not to be inorganic; it appears to be more or less thermolabile, and its action does not depend on the presence of mucin as such. It is suggested that the production of healthy carriers through contamination with the virus of poliomyelitis may be determined by the presence or absence of this inactivating or neutralizing property in the secretions. Whether this effect operates to prevent actual invasion of the virus and production of infection can only be conjectured. The authors suggest that probably the property is merely accessory and not the essential element on which defense against infection rests. It is more probable that other factors exist which help to determine the issue of the delicate adjustment between contamination and infection.—*Index of Oto-Laryng.*

EXPERIMENTAL PSYCHOLOGY.

The Comparative Sensitiveness of Blind and Seeing Persons.—Carl E. Seashore and T. L. Ling, Psychological Monographs, University of Iowa Studies in Psychology, Vol. XXV. No. 2, believe the blind have unquestioned superiority in their ability to use their touch, hearing, and other senses for guidance. From observation of this, the conclusion is generally drawn that the sensitivity of their sense organs is correspondingly heightened.

For purposes of demonstration, accurate comparative tests were made upon sixteen blind students from the Iowa College for the Blind at Vinton, Iowa, and fifteen pupils from the Iowa City High School. The ages of the blind ranged from sixteen to twenty-six and of the seeing from fourteen to nineteen. In selecting the blind, only those were chosen who had been totally blind for more than five years, who were generally otherwise both mentally and physically sound, and were now in high school grades. This resulted in the selection of the ablest pupils in the school. The seeing pupils were taken at random, being selected by the principal on the ground of convenience of schedule. On each of these the following six measurements were made:

List of Tests.

1. *Localization of sound.*—Discrimination for the direction of sound was measured in terms of the angular displacement in the horizontal plane directly in front of the observer. A click in a telephone receiver served as stimulus. The receiver was mounted at one end of a two-meter bar which was pivoted at the middle and carried a pointer running over a scale of degrees at the other end. The apparatus was mounted at such distance in front of the observer that the receiver moved at the distance of one meter from the center of the head. The click was produced by the

rapid make and break of the circuit through the mercury key. This whole arrangement proved very accurate and convenient, inasmuch as the angular displacement at this point and in this direction is very small. After a preliminary determination of the threshold one hundred trials were made by the method of constant stimuli.

2. *Discrimination for the Intensity of sound.*—This was measured by determining whether the second of two consecutive tones which differed in intensity only was stronger or weaker than the first. The tones were produced by a one hundred vibration electro-magnetic fork in circuit with the audiometer. A standard current of 1.2 volts was used and No. 30 on the audiometer was taken as the basal unit, the compared tones being either stronger or weaker. This provides a tone clearly audible and yet not unpleasantly strong. The records were kept in terms of the units of the audiometer, which represent approximately equal psycho-physic steps. After preliminary determination of the threshold one hundred trials were given by the method of constant stimuli.

3. *Discrimination for lifted weights.*—A set of bottles forty millimeters in diameter and ninety-five millimeters high was arranged as follows: 3 standards at 80 grams each and 12 compared weights yielding a series—81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 92, and 95 grams. The observers were blindfolded and the standard weights were changed in order to eliminate the temperature error. The weights were arranged with ample space on a small revolving table so that any desired weight could be swung into position without noise. After the preliminary determination of the threshold one hundred trials were made by the method of constant stimuli.

4. *Discrimination for passive pressure.*—A modified form of the Stratton pressure balance was used. This was built of aluminum which was lighter and therefore more sensitive than the original. By this form of the apparatus it was possible to increase or decrease the standard pressure instantaneously without the slightest jar. The standard pressure was five grams upon the outer side of the third phalanx of the first finger. The pressure location of this was changed slightly for successive trials and the least perceptible increase or decrease in weight was determined, one hundred trials being made by the method of constant stimuli after the preliminary threshold had been determined.

5. *Discrimination for active pressure.*—This was measured by determining under how many thicknesses of paper the position of a wire hair could be located by active exploration with the tip of the first finger. The apparatus consisted of a plate glass disc 10 cm. in diameter, mounted so as to revolve freely. In place of the hair a copper wire, No. 38 B & S, which is about the diameter of the average human hair, was stretched across the plate glass and with ends firmly fastened. Discs of paper cut from Old Veda Bond 17x22, twenty pounds to the ream, were placed over this wire, and the blindfolded observer was required to locate the direction of the wire through touch. Starting with ten sheets, five sheets were added for each trial until a failure occurred; then a single sheet was taken off or added until the greatest thickness through which the wire could be located had been determined. The record is therefore given in terms of the number of sheets of paper covering the wire. To one who has not performed this test, the actual results will seem to be very wonderful achievements, as the records show.

In this test much depends upon economic procedure in the hunting. The observers were therefore carefully taught how to proceed: *e. g.*, to run tip of finger from left to right and, if the wire was not found in that stroke, to run it in a line at right angles to the first; the wire being found by such economic procedure, it was comparatively easy to trace it. If it was not found in the first two strokes, these cardinal movements were continued until the observer acknowledged failure.

6. *Tactual space.*—This consists in the determination of the two-point threshold

in the transverse direction on the tip of the first finger and in the transverse direction on the inside of the forearm, 5 cm. above the wrist.

It is unfortunate that no more than one hundred trials could be made in each of these tests, where the method of constant stimuli was employed, but it must be remembered that much time, more than was required for the actual measurement, was spent in making preliminary determination and securing adaptation which is necessary for tests of this sort. Indeed the elemental character of the tests often hinges largely on full knowledge of all factors involved and skill in preparing the observer so as to eliminate sources of subjective and objective variables.

Statement of the Results.

Localization of sound.—In this test the blind are slightly superior to the seeing, especially in terms of the median. The blind vary more than the seeing, the coefficient of variability being 33 and 48 for the blind and the seeing respectively. The records of the former range from 1.2 to 5.2 degrees, while the latter vary from .5 to 4.4. The finest record of all was made by a seeing person.

The intensity of sound.—In this test the blind are slightly superior to the seeing, according to the median, but inferior by the same amount according to the average. The coefficient of variability is practically the same, namely, 32 for the blind and 33 for the seeing. Here again the best record of all is made by a seeing person, the same one, No. 13, who made the best record in localization of sound.

Lifted weights.—In this test the blind are inferior to the seeing, both according to the median and the average. The coefficient of variability is approximately the same, 23 for the blind and 24 for the seeing. Here the finest record made is the same for the blind as for the seeing. But there are more extremely poor records among the blind than among the seeing.

Pressure.—In this test the blind are somewhat superior to the seeing, both according to the median and the average. The blind are more variable, the coefficient being 40 for the blind and 33 for the seeing. The records of the blind range from .18 to 1.31 and those of the seeing from .13 to .98.

Touch.—In this test the larger the number the better the record. The facts therefore show that the blind are inferior to the seeing both according to the median and the average. There is but slight difference in the variability, although the seeing have four records that are better than the best record of the blind.

Tactual space on the finger.—In this test there is no significant difference in the median and the average. But the variability of the seeing is greater, the coefficient being 40 for the seeing and 27 for the blind. The seeing have two records that are better than the best of the blind.

Tactual space on the arm.—Here again there is no significant difference in the median and the average nor in the coefficient of variability.

The general conclusion then so far as the net results of the facts are concerned must be, that the blind and the seeing are, on the whole, equally sensitive to the direction of sound, intensity of sound, lifted weight, passive pressure, active pressure, and tactual space.

Interpretation of These Findings.

These experiments were planned on the assumption that the tests would be elemental: i. e., that the measurements were so simple and natural that training, experience and special skill would not affect the results. In other words, the aim was to test native capacity as distinguished from acquired ability.

The following conclusions are given:

First. The blind who are skillful in the use of touch, muscle sense, and hearing are not more sensitive or keen in sensory discrimination than seeing persons when fundamental capacities are tested.

Second. The necessity of making our psycho-physical tests elemental is strikingly indicated by the results of these tests.

Third. Development of the use of a sense consists not in the heightening of sensitivity or sensory discrimination but in the development of complexes and meanings in terms of these.

NEURO-DIAGNOSIS.

THE APPEARANCE OF THE FUNDUS OCULI IN CERTAIN INTRACRANIAL CONDITIONS.—J. A. Kearney, *Med. Record*, October 27th, 1917, writes that if the vaginal space which surrounds the optic nerve as far as the eyeball is in normal communication with the intermeningeal space, then any increase in tension of the cerebrospinal fluid exerts a correspondent pressure upon the optic nerve and its contents, and at times is sufficient to retard the normal outflow of lymphatic venous currents from the eye. As a result of this pressure an edematous change is seen quite early in the fundus. When this occurs an increase in tension of the spinal fluid will be noted when lumbar puncture is performed. If such pressure is present, changes in the fundus of the eye occur in the following order: The upper and lower margins of the disc near where the blood vessels penetrate are slightly obscured; next, the nasal half of the disc and its margins become blurred; then, the temporal half of the disc and its margins become hazy; following this, the edema of the entire disc increases until its height is measureable with the ophthalmoscope. When this measure is three diopters it is called choked disc. The changes that usually occur in a choked disc are as follows: At first it is red and juicy, then densely opaque lines pass down its sides. Later it assumes a mound shape and this entire surface is densely opaque with linear hemorrhages. The veins are swollen and torturous, covered here and there with infiltrate. The mass then bceomes pale and finally an atrophic nerve head is the result.

Thirty-five cases of brain tumor in Dr. Sharpe's service were studied. Thirty-two were operated upon. From the standpoint of vision a decompression is advised before the edema becomes densely opaque, because when this appears destructive changes have taken place in the nerve and good vision cannot be assured. Every patient who is suffering with an uncontrollable persistent headache should have a careful ophthalmoscopic examination made. If this is done sufficiently early, we may not only prevent loss of vision, but save the life of the patient by an operative interference.

Intracranial hemorrhages at birth are responsible for 70 per cent of the spastic paralyses in children and 20 per cent of the resulting idiocy and feeble-mindedness now existing. The most damaging factor here is the increase in the cerebrospinal pressure as a result of the hemorrhage. One of the earliest signs of increased intracranial tension is found in the fundus of the eye. A general edema blurring all retinal and disc details or a mild edema blurring the nasal half of the disc, or rarely a measurely edema occupying the entire surface of the disc, is usually found in the eyes of infants shortly after birth when such hemorrhage is present. If the doctor suspects a brain injury after a difficult or instrumental labor, a careful examination of the fundus of the infant's eye should be made. Occasionally a child may be found that shows these changes indicative of an increase of intracranial pressure, and if this is verified by lumbar puncture, a modified decompression operation to remove the hemorrhage is indicated in selected cases. One human may be saved the fate of a spastic child or of an imbecile in the event of such an operation. The eye-grounds in those cases that are allowed to go without treatment and have paralyses or are imbeciles, reveal certain regressive edema changes which range from a mild to a very pronounced type. Almost fourteen hundred children having spastic paralysis, with or without impairment of the mental faculties, of ages varying from one day to twenty years, have been examined with the ophthalmoscope to determine the presence or absence of the increased intracranial due to hemorrhage. Three hundred of these have shown distinct fundi changes. These children having increased intracranial pressure are the only ones that can be benefited by the intracranial operation.

Two hundred and twelve cases were observed at Dr. Sharpe's service at the New York Polyclinic Hospital in which a diagnosis of fractured skull was made. These cases were examined within twenty-four hours after admission to the hospital. There was usually found a general edema blurring equally all the details in the fundus of the eye. The venous twigs when visible were dilated out of proportion to the size of the arteries. When the edema increases and the spinal mercurial manometer registers twice the normal pressure, it is advisable in these skull fracture cases to keep them at rest in bed and to perform repeated lumbar punctures, depending upon the nature of the symptoms. If the cerebrospinal pressure is more than double the normal, in selected cases, a simple decompression is advised.—*Index of Oto-Laryngology.*

NEURO-SURGERY.

FRACTURE OF THE SPINE WITH CORD AND ROOT SYMPTOMS.—C. A. Elsberg, *Ann. Surg.*, 1918, LXVII, 63, writes that there is no question in surgery in which there is a greater difference of opinion between radical and conservative surgeons as to the indications for operation. All should agree that there can be no regeneration of an anatomically severed cord, and in complete destruction of the cord at any level there is immediate loss of all power and sensation below the level of the lesion, with loss of all reflexes and of control of the bladder and rectum. After a few days some of the defensive reflexes may appear, but these should never be confused with true spinal reflexes. In partial lesions some motor, sensory, or reflex functions are usually present. There are, however, cases in which the first symptoms are those of a complete lesion, but in which after a few days, weeks or months there is a considerable return of function. In these cases the nerve block is due wholly or in part to concussion of the cord and not to complete anatomical separation. It is clinically often impossible to distinguish these cases. In recent transverse lesions the fatal outcome is very often hastened by operation. On the other hand, no harm will result from watchful waiting. If the signs of a complete lesion persist, operation is useless; if there is some return of function operation has a better chance of success.

More than a modicum of neurological knowledge is necessary to determine a real transverse lesion. Not only are the senses of touch, pain and temperature lost, but also deep muscular and vibratory sensation. Muscle tone is completely abolished. Blood in the spinal canal can never exert sufficient pressure to cause symptoms of a transverse lesion. Root pains are usually absent. The return of the flexor response of the great toe and the change of a flexor into an extensor type is of very great significance as an indicator of the transmission of some nerve impulse through the cord.

In crushing injuries of the lumber vertebrae, in which the roots of the cauda are affected, a laminectomy should always be performed as soon as shock has been overcome. Regeneration of divided caudal nerves can occur. There should be wide decompression and the divided roots should be united by sutures. In partial lesions the problem is different. Pressure from dislocation or fracture of bone may be contributing much to the symptoms and relief by a wide decompression is certain to be of great benefit. The irreparably damaged cord cannot, of course, be benefited. If the cord be swollen and edematous it may be incised at the posterior median fissure, and in some cases an intramedullary collection of blood may be removed by aspiration through a fine needle. Thus a subsequent gliosis may be prevented.—*Cleveland Med. Journal.*

SPINA-BIFIDA—ITS OPERATIVE TREATMENT.—Beckman and Adson, *St. Paul Med. Journ.*, December, 1917, formulate the following conclusions:

1. Spina bifida is caused by increased cerebrospinal pressure rather than by bony defects in the arches of the vertebrae.
2. The age of patients most suitable for operation is from nine months to two years.
3. At the time of operation the spina bifida should be free from infections which may be due to abrasions of the skin or leakage of the spinal fluid.
4. As a general rule, paralysis associated with the spina bifida remains unchanged by the operation.
5. Spina bifida associated with hydrocephalus should not be operated on until the hydorcephalus becomes stationary or the pressure is relieved by some operative procedure.
6. It is not advisable to operate on adults unless they are having serious trouble, since the mortality will be high because of the frequency of necrosis of the skin-flaps and of meningitis.

PSYCHIATRY.

THE STUTTERING BOY.—Knight Dunlap, *Journ. of Abn. Psychology*, April-May, 1917, noting that a stuttering girl is a rare phenomena, while stuttering boys are common, concludes that there must be some connection between this sex-limitation of stuttering and the cause or causes of the trouble. The source of stuttering must be sought in some peculiarity of the language function of the male which is not found in the language function of the female, and not, as is popularly supposed, in mere shock, fright, or 'nervousness.'

The theory of stuttering which suggests itself most readily is based on the supposition that in the animal kingdom generally, the voice of the male is more definitely a sex function than is the voice of the female. The voice is one means of wooing; and we might expect that in the sex excitability of the adolescent period this function, so intimately associated with the primary sex functions, would be especially liable to derangement. This may be so; although there is little evidence that in the human animal the male's voice is more sex expressive than is the female's, or that the adolescent boy is more excitable sexually than is the girl. In any case, this theory does not explain why the speech derangement takes the general form of stammering or the specific form of stuttering, and hence the causes it proposes are at the most but contributing or predisposing influences.

The actual determining cause of stammering for a large proportion of cases is clearly indicated by the data obtainable from the cases themselves. Two facts stand out from this data: first, that the stammering dates (where the dating can be definitely made) from the time when the boy first went to school, or began first to associate with a number of other boys; and second, that in many cases (not in all), the stammerer has especial difficulty with words beginning with one of a small group of sounds—the sounds with which certain obscene words much favored by small boys also begin. Bearing these two facts in mind, it is usually possible to find that at the time when the stammering commenced to develop, the boy became familiar with a certain list of terms which he employed with satisfaction among his juvenile friends, but which it would never do to let his mother, father or sisters hear. These terms are usually obscene, but may be in part profane expressions, or merely words like 'damn' or 'hell.'

The boy who has a rugged constitution may keep his two linguistic personalities distinct and apparently suffer no harm. The boy who has no great scruple (or fear) about letting out his gutter-vocabulary, occasionally at least, in the hearing of his family, never becomes a stammerer. But the boy who is 'carefully brought up,' if he is handicapped by a weak constitution, or predisposed by hereditary tendency to erratic muscular activity (such as may be expressed by continual twitches of the face, 'nervous' movements of the hands or feet, etc.) is very apt to become a stutterer, or a stammerer of the deadlock type.

The enunciation of a word is a complicated process, requiring the co-operation of a large number of muscles in a very intricate combination; which is bound together by what we call in psychological language, *association.* Two words which begin with the same sound—as for example, *sh*eep and *sh*ingle, have the same initial group of movements associated with different succeeding movements in the two cases. Hence there is always a possibility that the initial sound which ought in a given case to be followed by the remainder of the one word, may, through the going astray of the association be followed by the remainder of the wrong word; a type of 'slip of the tongue' which occurs occasionally to every one. The boy, in constant fear lest one of his obscene terms may slip out in the wrong company, and having experienced this dangerous tendency of words to go astray, soon comes to hesitate over every word which begins in the same way as do these dangerous words; and as the hesitation becomes a more and more fixed and noticeable habit, it extends to other types of words also.

This danger of a slip would not be present if the forbidden words were not associated, as wholes, with the other words in the boy's habitual forms of speech. The root of the whole trouble is that the boy has formed the habit of using these terms, not merely in discussing matters of sex (which, of course, he would not ordinarily discuss with his family), but also in talking of more commonplace topics.

The peculiar feature of stuttering: the repetition of the syllable many times, is a result of the usual method of checking the utterance of a word; the nervous discharge which should go to the forming of the remainder of the word must go somewhere, and the easiest disposal, in the beginning of the trouble, is to let it discharge into the same act which has already occurred, namely, the production of the initial sound of the word. In later stages of the disease, the nervous energy may be discharged to the muscles of the face in such a way as to give the tetanic contractions of the non-stuttering stammerer. Usually, however, the stuttering rapidly becomes a permanent habit, although complicated by the other type of stammering.

Simplistic as this explanation sounds, a very large proportion of the cases of stammering are directly traceable to it. In most cases the boy's parents have not merely established conditions excellent for the habit-formation, but have more directly contributed by administering drastic punishment (such as washing out the mouth with soap), or still more deadly moral horror, when a telltale slip has occurred.

Other causes of stammering occur; but they are generically like the more frequent causes just described. The fear of giving incriminating information of some sort other than that of mere vocabulary; an undue sensitiveness or worry about certain topics not discussed in mixed company, or similar mental conflicts, are at the bottom of certain cases, which usually are not of the typical stuttering type.

The reason girls do not stutter is fairly evident. They are not subjected to the same conditions as are boys and do not develop the same fear of revealing a *tabu* vocabulary, although they may have incriminating matter to conceal, and may develop accordingly a hesitating type of stammering. Small girls undoubtedly do discuss with their schoolmates matters of which their purblind guardians presume them to be quite ignorant; but they do not embody the vulgar terms of these topics in their conversation about other matters, as boys do, and hence they have little fear of words popping out of their mouths at inauspicious times.

Angry girls of tender age may reel off strings of smutty words worthy of the best efforts of any boy; but these girls are practically always from homes in which an occasional (or frequent) outburst of such diction would have no very disastrous consequences. 'Proper' little girls do not talk that way among themselves—'proper' little boys do, and it is the 'proper' little boys who become stutterers. There are, however, some stuttering girls, and they have undoubtedly been subjected to precisely the same social conditions which produce stuttering boys.

The same applies to cases of chronic stammering. Everyone stammers and stutters —more or less, just as everyone shows from time to time a variety of inaccuracies of movements of other types. Imitation plays a definite rôle in some cases. Occasionally a family is found in which nearly all the members stutter; inheriting in common a 'nervous' disposition, the form of expression it takes in one member may determine the form in the others. The imitative factor is often shown in a ludicrous way when a person who normally does not stutter is talking to a chronic stutterer. In such cases, especially when there is emotional excitement, it may be difficult for the auditor to determine which of the two is the worst stutterer.

The cure of stuttering is a difficult matter. In most cases the original cause has ceased to operate, and the stuttering has become merely a fixed and well-nigh unbreakable habit before expert assistance is sought. But the prevention, which is a more important matter, would be relatively simple, if it did not require a certain degree of intelligence on the part of the parents; a requirement which few parents meet in regard to their own children. The essential thing is the avoidance of the fear-stimulus. If your small boy, who probably can use some lurid language among the fellows, knows that (as one small stutterer expressed it to me) you would "have a fit" if you found him out, you are taking an unjustifiable risk, however small, of making a stutterer of him, and a great deal larger risk, of course, of making him immoral in some other way. There are far safer and more effective ways of discouraging the taste for bad language than by taking the I-would-be-shocked or the it-would-break-my-heart attitude.

The author offers the following advice to the father: "If your small boy commences to stutter, find out what obscene and otherwise objectionable terms the boy is apt to be using, and then make an opportunity to talk to him about these terms, telling him (if you can truly) that you did use these or equivalent words yourself, and have stopped it. At any rate, make it plain to him in one way or another that your attitude towards him, if he should break out with such language, would be no more contemptuous, crushing or sniffling than if he should break out with measles."

SOMNAMBULISM.—Professor Bernheim, *Le Progres Medical*, January 12, 1918, discussing the conception of somnambulism, states that somnambulism is often a dream in action. The dream takes place when sleep is incomplete, when active cerebration and intellectual initiative are benumbed but passive cerebration due to the imaginative faculties is still awake. Dreams are the product of this imagination uncontrolled by the faculty of reason. It is in the first period of sleep or in the last period just preceding awakening, the control being already asleep or not yet awakened, that dreams arise. When sleep is profound and the imaginative and attentive faculties are in slumber, dreams become extinguished because there is unconsciousness and cerebral silence.

In the waking state an active imagination evokes ideas and dreams, but these are swept away by the control. Reason effaces fantasy. But when the brain is in a passive condition and is not activated by an idea or an active impression, when the individual is in deep revery without fixation of his attention, automatic imaginaton comes into being and elaborates more or less colored dreams, sometimes hallucinations. The mind wanders back to the past, to reminiscences, to visions, until an active stimulation, the voice of a friend, for instance, recalls the individual to the present reality, awakens the spontaneous action of the brain and dissipates the fantastical musings to the light of the control.

Dreams may be passive. The subject hears, sees and assists in the occurrences, even in those which concern him, but as another self. He remains immobile and is not subjected to any emotional impression. On the other hand he may become identified with the action without realizing it, but will be subject to emotional impression—gay, sad or frightening. The impression may be so vivid as to produce an intense distress and awaken him. This is a nightmare. On the other hand, the dream may be taken into action. The subject arises, goes, comes, writes, does something with intelligence. The servant sweeps or cooks; the workman climbs up a ladder, following the idea which impels him. The subject may have his eyes open, often he will even respond to questions. In fact, he may give no sign of sleep. He resembles a subject under experimental suggestion in the waking state. He is awakened but continues the suggestion created by the dream. This is active somnambulism. The action has been created by the dream. But in reality there is no longer any dream, nor sleep. The impression of the dream has awakened the subject, but has left the suggestion of the dream. The cerebral control is absorbed by the dominant suggestion. The student who, impelled by an idea in the condition of semi-slumber arises and goes to his desk to work, does his work with intelligence, reflection and judgment; the preacher who writes his sermon and corrects the mistakes in style and orthography; the servant who sets the table and arranges the dishes; the coachman who takes his horse and after taking a long ride comes back to his normal state astonished to find himself away from home and not knowing how he got there—all of them accomplish these acts as they would in ordinary life. They are not dreaming; they obey an idea, a suggestion which has come to them in the dream, created by the imagination.

Somnambulism is a more or less prolonged suggestion, realized by the subject with all his activity of body and mind. Spontaneous auto-suggestions, born in the waking state as a result of vivid impressions, psychic disturbances, railroad accidents, emotional or traumatic shock, acute diseases, hysterical crises, epileptic petit mal, etc., can, when the psychic control is benumbed as during sleep, create a state of special consciousness with automatic cerebration in certain subjects, *i.* e., predisposed subjects, because the majority of suggestions whether in dreams or in the waking state remain passive and are not realized.

Certain somnambulists, the auto-suggestive acts having been accomplished, do not believe that they have at all been asleep; they do not believe that they are subject to somnambulism. An idea or a series of ideas has come to them which they have performed as in a perfectly waking state.

But a great many have no recollection of what they have done. They are astounded when they are told and believe that they have acted automatically during sleep. Others have a vague recollection of certain things they have done or the recollection comes later as a result of the association of ideas.

It is this amnesia, when it exists completely, that has given rise to the idea of a dual life, of a somnambulistic life. What seems to confirm this conception is that often the recollections of the normal life are found again in a new somnambulistic life. But is it not the same in normal sleep? Passive dreams may be entirely forgotten after awakening. Sometimes they are recalled vaguely and return to memory spontaneously or upon the association of ideas. Sometimes the dreams are completely forgotten during the waking state but reappear continually during sleep. Amnesia is not, therefore, a characteristic of somnambulism. Whether there is amnesia or not, complete or incomplete, the phenomenon is the same. All states of consciousness profoundly modified at certain times, as after an emotion, a trauma or a febrile disease show sometimes, after the normal state of consciousness has returned, a variable degree of amnesia.

In our every-day life do we not at times fall into a revery and when we come to ourselves again do we not recall very imperfectly the object of these musings? And if they come upon us while we are en route to a certain place, absorbed by these reveries we lose our object in view, we continue onward, perhaps muttering to ourselves in a low voice, changing our direction, and we feel greatly astonished, when we return to our consciousness, to find ourselves elsewhere than where we ought to be.

Experimental suggestion, like spontaneous suggestion, may be taken into action and produce somnambulism. I have proved that the acts done in this condition are, or seem to be, entirely forgotten and that they can always be recalled to memory by fixing the subject's attention, his eyes being closed, and thus creating by concentration of the mind the state of consciousness under which the suggestion was made.

But are we not very often under suggestion without knowing it? The ideas created by education, lectures, conversation, diverse impressions and incidents of life, remain latent in our brain and can become awakened into consciousness under favorable conditions or associated impressions. Is not our belief in our spontaneous initiative due often to our ignorance of the underlying motives? In reality, normal actions of our every-day life are often determined by suggestions of unknown origin, just like the actions of somnambulists. If the acts performed in somnambulism can be natural without anything unreasonable about them and are only designated somnambulistic because they are performed during sleep, dictated by the suggestion of the dream, the same acts during the waking state would seem automatic because of the non-recollection of any immediate determination for them. At other times these acts are not natural but bizarre, often without purpose or connection, even criminal. The somnambulist who climbs on the roof, who runs through the rooms or through the streets, jumps on the furniture, mounts on the window sills, who sings and cries and who seems in delirium or under hallucinations and then returns to his normal state with amnesia, gives the impression of a morbid psychology.

Undoubtedly, these actions are not normal but do they implicate a special psychology, a dual life distinct from the normal life? Do not these acts exist in imagination, in the passive dreams of natural sleep, when we accept without control the most singular and disordered ideas and undergo the illusion that they actually exist? Is not this a passive somnambulism? When the subject puts the dream into action the somnambulism becomes active. If in this stae of auto-suggestion the control remains sufficient to overcome the unreasonable products of imagination the subject passes into action the reasonable ideas only. But if the control is insufficiently awake or too dominated by the suggestion of the imagination all the fantasies evoked are let loose and produce most diverse, incoherent and multiple actions.

It is the same with somnambulism manifested without sleep, either spontaneously by auto-suggestion or following emotional states. If to the diminution in the control faculty produced by the morbid condition there is added an exaltation of the imaginative faculties, the somnambulistic acts may be most unreasonable up to delirium and hallucinations, just as in their production during the dream in sleep.

Somnambulism is a condition of more or less prolonged suggestion put into action by the subject, and suggestibility is a physiological function of the human brain.

PSYCHOLOGY.

HALLUCINATIONS IN THE SANE.—Robert Hunter Steen, *Journ. of Mental Science*, July, 1917, in an elaborate study of the subject, with an extensive bibliography, refers to the frequency of hallucinations in the insane, but maintains that all those who have hallucinations are not insane; in other words, hallucinations occur in the sane.

The author primarily divides the subject into: (a) Hallucinations the result of agencies operating upon the brain or nerves; (b) Hallucinations of mental origin. These are subdivided as follows:

(A) Hallucinations the result of causes operating upon the brain or nerves.
  (1) Toxins.
  (2) Disorders of the brain circulation, e. g., anæmia, congestion, etc.
  (3) Disease of end-organs.
  (4) After-images.
  (5) Brain diseases of obscure pathology, e. g., epilepsy, migraine.

(B) Hallucinations of mental origin: Those in which so far as our present knowledge goes a physical agency is unknown.
  (1) Suggestion.
  (2) Hypnotism.
  (3) Crystal gazing, clairvoyance and clairaudience.
  (4) Hysteria. Somnambulism. Multiple Personality.
  (5) Hypnagogic visions.
  (6) Dreams.
  (7) Hallucinations in history.
  (8) Collective hallucinations.
  (9) So-called telepathy.
  (10) Hallucinations the result of a complex.

These are discussed seriatim and the author's conclusions are thus summarized:

(1) Hallucinations *do* occur in the sane. Such cases should be intensively studied, for, if any progress is to be made in our knowledge of hallucinations, results of value are more likely to be obtained in persons whose intelligence is neither dimmed nor distorted by insanity. Especially worthy of minute inquiry are hallucinations found in border-land or hysterical cases.

(2) There is no reason to believe that an hallucination occurring in a sane person differs in any essential respect from that which occurs in an insane person.

(3) If this be granted, then, seeing that hallucinations in the sane can be produced by toxins, no doubt hallucinations in the insane are also in some cases the result of toxins. In this connection it is noteworthy that hallucinations are most frequently met with in the insanities of alcoholic origin.

(4) It is, however, true that hallucinations can occur independently of physical changes such as might be produced by toxins or disease of the brain. An idea may be visualized or converted into a voice, smell, or other sensory phenomenon. The idea may be introduced from without, as in waking-suggestion, hypnotism, collective hallucinations, and, perhaps, crystal-gazing. Or the idea may arise from within, as in some phenomena of crystal-gazing, dreams, somnambulism, multiple personality, etc. In the so-called telepathic hallucination of my friend the idea of his dying sister was ever present with him, and it is not surprising that her face appeared before him. In the hallucinations of the religious ecstatics, e. g., Joan of Arc, the mind was filled with overwhelming ideas which were converted into hallucinations.

If all the foregoing be granted, then it does seem probable that hallucinations in the insane can, in certain cases at any rate, be best studied from the psychological point of view. Such a study would make use of psychological terms only. The brain and nervous system would not be mentioned in the discussion. It is my belief that progress in the future must be expected on these lines rather than in approaching the subject from the physiological point of view.

(5) It is a very suggestive fact that hallucinations are met with in cases of multiple personality. This of itself does not prove anything, but in every case presenting hallucinations some process of dissociation is at work. If this is so, then halluci-

nations would be expected in cases of multiple personality where dissociation is seen in greatest extent. A fuller discussion on this must be reserved for another occasion.

PSYCHO-ETIOLOGY.

THE MENTAL IMAGERY OF STUTTERERS: AN EXAMINATION OF CERTAIN CURRENT THEORIES.—John M. Fletcher, *Journ. of Abn. Psychology*, April-May, 1917, writes that since the middle of the eighteenth century authorities in constantly increasing numbers have claimed that stuttering is essentially a mental abnormality. It is rather interesting to note a belated student of this subject rising to announce that he has 'discovered' or has 'conclusively shown' what other students have 'discovered' and 'shown' many years ago. To feel that we have at least got far enough to reach an agreement as to the general character of this affliction is encouraging, for we have passed the stutterer by for centuries with a feeling of ignorant fatalism as hopeless as that which once greeted many other human ailments that now yield to treatment. But when one studies the wild guesses and hasty conclusions as to just what constitutes the essential nature of the stutterer's mental abnormality one feels like warning him against expecting an early day of deliverance.

There are at present two widely divergent theories on this point of the general character of the defect. One, adopting the Freudian hypothesis, holds that stuttering is the result of repressed emotional complexes of a sexual kind that date back to childhood. The writer is at present gathering data regarding one of the fundamental assumptions of this theory and hopes to submit conclusions at a later date. The second prominently mentioned theory holds that stuttering is (as one author actually asserts), or rather, is due to, an abnormality of mental imagery. The essential features of this theory were first stated by T. Hoepfner. Two varieties of the theory have appeared in the American literature. One is the thesis of Blumel, who believes that "The stammerer's difficulty is transient auditory amnesia," and that the stutterer is of a fixed imagery type, being an "auditomoteur," but in the act of attempting to speak he loses the auditory imagery, and cannot reproduce mentally the "vowel-color," but relies wholly on kinaesthetic images.

Another type of this same theory is that which has been proposed by Dr. Swift, which is that "Psychoanalysis reveals stuttering as some vague trouble in the personality. Psychological analysis shows stuttering is (!) an absent or weak visualization at the time of speech. This new concept of stuttering as faulty visualization may be called Visual Central Asthenia. This lack or weakness in visualization accounts for all the numerous phenomena of stuttering in severe, medium, or mild cases."

When a stutterer hears a sentence which he has been asked to repeat, the thing naturally uppermost in his mind is not the meaning of it or the visual qualities of the objects described in it, but his own chances of uttering it without stuttering. He is as capable as others of appreciating meaning, and, as the author has repeatedly found by experiment, of visualizing, but the pressing need of the moment is to avoid stuttering if possible. Stuttering is to the stutterer a very unpleasant experience. The anticipation of painful or unpleasant experiences is the natural source of dread and fear. The stutterer is in a state of dread or fear while anticipating the necessity of speaking. As a sample of the latter kind of evidence, it was found in a certain group of stutterers that the average pulse rate after being told that they would be asked to speak, but before speaking, was 90.2 with a maximum of 120. To ignore this dread or fear, which is absent in the normal speaker and always present in the stutterer, and to attempt an explanation solely on the basis of the imaginal or ideational processes involved in speech is the fatal error into which both Bluemel and Swift have fallen. They hold that the stutterer stutters because he loses his mental imagery, whereas in fact he loses his mental imagery because of stuttering. It is the study of causes, not of symptoms, that will open the way to progress in the study of this problem as it did in the case of the study of hysteria.

From a brief discussion of the current theories concerning the essential pathology of stuttering, the author believes them to be so palpably wrong that a lengthy investigation into their merits seems unnecessary. However, by methods in common use in psychology, a study of three cases has led the author to the following conclusions:

1. There were no permanent peculiarities of imagery that would in any way distinguish them from normal persons.

2. No pure imagery type was found, each of them employed different kinds of imagery in thought processes with a possible preponderance of visualization.

3. When asked to react by speaking the stutterer has a tendency, in proportion roughly to the severity of his difficulty, to lose not only visual but all other kinds of imagery immediately before speaking. These images tend to give way, for the most part, to kinaesthetic sensations localized especially in the throat and in the organs of articulation. When asked to react by writing, detailed, and in certain instances vivid, imagery was reported.

PSYCHO-PHYSIOLOGY.

THE LAWS OF RELATIVE FATIGUE.—R. Dodge, *Psychol. Rev.*, March, 1917, who has for many years been working on the subject, here deals (in a Presidential Address to the American Psychological Association last year) with one limited aspect of these problems: the relativity of fatigue. He is more concerned with the scientific than with the practical aspects of the subject, for he considers that the extreme practical importance of fatigue has injured its proper scientific investigation. For this we must know what mental fatigue is, if it exists at all, and how it is conditioned.

If the word fatigue has any scientific propriety in connection with mental life it refers, the author believes, to the metabolic conditions of mental action, and not to any predetermined characteristic of its consequences. He regards it as improbable that any of the mental work decrements commonly treated as mental fatigue are ever simply conditioned by true fatigue processes in nervous tissue, while, conversely, real fatigue may not appear as decrement at all. He invokes the physiological fact that nervous tissue has been found quite resistant to fatigue, while, on the contrary, hyperexcitability is an almost regular phenomenon of extreme mental fatigue. The complete cessation of mental processes cannot mean a correspondingly complete fatigue of nervous tissue. Again, the traditional differentiæ of fatigue fail to exclude normal psycho-physical rhythms, of which the most significant is sleep. There is no physiological justification for the belief that sleep is the daily climax of fatigue, and for some people evening is the best time for work. The conditions for sleep are not, however, simple, and include habit, the absence of stimuli, probably widespread inhibitions, and possibly gland products and vasomotor changes. Restriction of activity is more potent than over-exertion. "Lecturers never go to sleep, the audience may." A third argument against the true fatigue character of so-called mental fatigue lies in the means used to induce it. To produce nerve-muscle fatigue the same tissue is successively stimulated in the same manner. In mental fatigue the greater the complexity of the task, the more pronounced the decrement. This is probably due to confusion between paths of discharge and not to fatigue of any one path. It is not really fatigue, but merely associative rivalry. A fourth reason may be found in the operation of incidental inhibitions, which, when attention is concentrated in one field, produces a pseudo-fatigue effect in other fields.

Putting aside irrelevant conceptions of fatigue, is there in mental life a real fatigue effect? Dodge believes there is. But it differs from nerve-muscle fatigue in two respects: inconstancy of the stimuli and interaction of competing paths. In nerve-muscle fatigue experiments, the stimulus (usually the faradic current) is more or less simple, constant, and regular. In mental fatigue experiments, it is necessarily unknown and variable, and, still more important, the ever changing inner factors, such as personal interest, are unknown. Perhaps true mental fatigue is really fatigue of the inner stimuli rather than of the capacity to react. Sometimes there are successive changes in the inner stimuli resulting from fatigue, though the work is continued. Dodge holds that the first law of relative fatigue may be formulated thus: "Within physiological limits, all fatigue decrement in the results of work is relative to the intensity of the stimulus." The adequate adjustment of stimuli is a very real problem in practical life, and in the training of both normal and abnormal children. Continuous activity under the reinforcement of emotion, or even in the educational use of play, may be a source of serious fatigue, as Kraepelin holds. Another conspicuous reinforcement is worry. It would seem to be no accident that this is so closely connected with exhaustive psychoses.

There is, further, the complication of what Sherrington calls competition. Any afferent impulse in the higher nervous system may theoretically activate any efferent path. We thus reach a second law of relative fatigue: "In any complex of competing tendencies the relatively greater fatigue of one tendency will tend to eliminate it from the competition in favor of the less fatigued tendencies."

The longest mental process ends at last. But the causes are many, and fatigue is only a single contributory factor, less important than intercurrent competing tendencies. That is why in pathogenic nervous exhaustion it is a therapeutic measure to strengthen some competing interest—to develop some fad, play, interest, or what not. But most normal lives are too full of competing interests. Any monotonous work leads to an insistent demand for change, just as when, after lying awake sometimes, we turn over, not from fatigue, but because in the complex of competing tendencies, a little relative fatigue may lead to the entirely disproportionate result of a change of the whole body mass. Social changes are caused similarly by relative fatigue, a desire to shift the pressure. All the phenomena of restlessness are similar. "They operate in work and play, in social and economic activities, in politics and in religion. Without this interference in our lives, unwelcome as it often is, we must have continued indefinitely in the direction of our first activity, with the consequent loss of that vital equilibrium on which the organism as a unit of different parts depends for its continued existence. Relative fatigue, then," the author concludes, "is not a mere limitation of human efficiency. It is not exhaustion, but prevents it. It is a conservation of organic equilibrium, as well as a condition of organic development."—*Journ. of Mental Science.*

THE PSYCHO-PHYSIOLOGICAL THEORY OF RIGHT-HANDEDNESS (*Theorie Psycho-Physioloque de la Droitrie*).—Mlle. Ioteyko, *Revue Philosophique*, June and July, 1916, introduces the subject by enunciating the doctrine that the normal human being is asymmetrical. "In 1903," she says, "I expressed the opinion that the normal man is asymmetrical. The principle of the bilateral symmetry of the organism, established until recently in biological sciences, is replaced today by the idea of asymmetry, which, far from being an abnormal or pathological phenomenon, is, on the contrary, the expression of the natural state. One of the halves of the body is more developed than the other from an anatomical and physiological point of view. In the case of the right-handed man, it is the right side which is favored; in the case of the left-handed man, it is the left. Now, each half of the body being dependent on the hemisphere of the opposite side, one sees that in the case of the right-handed man it is the left brain which is most developed, whilst in the case of the left-handed man a greater development of the right brain is assumed." This thesis is supported by references to the works of many observers.

The author then proceeds to consider the various theories which have been put forward to explain the origin of right-handedness. They are numerous and ingenious, and some of them, particularly those advanced on anatomical grounds, deserve far more attention than has been given them in the paper. Herber's theory, which approximates most closely to the writer's, is fully discussed.

In the statement and explanation of her own hypothesis, Mlle. Ioteyko is very diffuse. The proposition may be epitomized as follows: Among the influences of muscular work, that which it exercises on the heart is the most important. Overwork of the heart is often determined by physical labor. Death from fatigue, which one observes in exceptional cases, is due to stopping of the heart. Fatigue of the heart is then the rock to be avoided in muscular movement. It is natural to admit that some form of auto-regulatory mechanism must exist in man, some mechanism which exercises a protective action with regard to the heart. And the writer supposes that it is this defensive action which incites man to use by preference in hard work either the right hand alone or the two hands at once, but always avoiding the use of the left hand alone, because by its situation in the neighborhood of the heart it finds itself in closer connection with that organ than the right hand. Finally, muscular work executed by the left hand ought to react more violently on the heart than work done by the right, and to prove the truth (or otherwise) of this proposition the writer carried out certain experiments in the psycho-physiological laboratory of the University of Brussels.

The experiments were made on 32 students (22 males and 10 females), æt. about 20. The work imposed on each arm was as follows: The forearm being flexed on the arm, each subject was given a weight of 2.50 kgrm. to hold in the hand. The subject, in a standing position, had to raise the weight every two seconds above his head to the complete extension of the arm. The men were required to raise the weight thirty times, the women twenty. When the subject entered the laboratory, he remained at rest for several minutes. After this period of repose, the rapidity of the pulse was observed and noted down as the normal state. The work, mentioned above, having been executed with one hand, the pulse rate was again observed. Half an hour later, the same experiment was performed with the other hand. And later again it was carried out by the two hands simultaneously, each hand being laden with a weight of 2.50 kgrm.

Taking the average of all the experiments, which included right- and left-handed men and women, the writer considers it was demonstrated that the fatiguing work of the left hand produced a more intense effect on the heart than the same work performed by the right. In examining the results by groups (right- and left-handed, males and females) this conclusion was not so clearly demonstrated. It is interesting to observe the enormous gain for the heart when one works with both hands simultaneously. The mechanical work is doubled, and the cardiac beats are not proportionately accelerated.

Applying her theory to the explanation of the causation of right-handedness, Mlle. Ioteyko considers that the right hand has developed greater strength than the left for the reasons enumerated above (saving the heart from overwork and consequent overfatigue). Right-handedness is then an acquired superiority in phylogenetic development. The work of the right hand has reacted on the left hemisphere and produced its supremacy, and that not only from a motor point of view, but also from that of sensibility, address, and intelligence, because of the connections existing between the differnt centers. Thus the difference between the two hemispheres, at first physiological, has become psychological in the course of time.

In discussing the subjects of the education of the left-handed, ambidexteous education, etc., the writer refers at length to a system of reform of reading and writing proposed by Mlle. V. Kipiani.

In reading, this lady wishes to avoid the fatigue to the eyes in passing from the end of one line back to the beginning of the next, which requires constant change of accommodation. She thinks that this asymmetry of reading, which is performed always from left to right, and the abrupt and oblique movements imposed on the eyes at the end of each line, are the principal causes of many of the abnormalities of the eyes found among readers.

In order to remedy these inconveniences, Mlle. Kipiani proposes that books be printed in the following fashion: One line to be printed in ordinary characters and read from left to right in the ordinary way; the next line to be printed *en miroir* (each letter being reversed laterally), and read from right to left, and so on. In this way continuity of seeing will be assured, and the abrupt movements of the eyes will be avoided.

With regard to penmanship, Mlle. Kipiani advocates ambidextrous writing. Taking into consideration that the natural movements of the two hands are divergent from the middle line of the body, the right hand will write on a sheet of paper placed on the right side, and the left one on the left side. In each case, the act of writing is to be performed as follows: The first line is to be written in the ordinary fashion; the second *en miroir;* the third in the ordinary way, and so on. The sole difference between the two hands will be that each follows its natural slope; the right will slope from right to left, and the left from left to right.

Mlle. Kipiani also makes certain statements with regard to the orientation of Children's drawings and of the figures in the pictures of ancient and modern artists. I have examined the correctness of these statements in an article on "The Orientation of Human and Animal Figures in Art," which appears in the present number of the Journal.—*Jour. of Mental Science.*

ON THE MENTALITY OF THOSE WHO COMMIT SUICIDE.—Prof. Francesco Del Greco, *Il Manicomio*, April, 1916, considers the most important elements in the mentality of an individual about to commit suicide are sadness, or rather melancholy in the common acceptance of the word (I hardly think the word depression quite conveys the writer's idea), *tedium vitae*, and impulse.

Impulse alone explains some unusual cases of suicide, especially those in which prisoners who have failed to prove themselves innocent kill themselves, or those in which people destroy themselves in anger, pain, or anguish.

After excluding other causes, such as imitation, suggestion, intense love, etc., the author returns to the consideration of sadness and *tedium vitæ*, which, linked together and overlapping, become a sentiment of profound weariness, loneliness, and desolation. The sufferers say themselves that life is not worth living, that life has no value. To this mental condition the author applies the term *vuoto dell'animo*, which may be translated as emptiness or loneliness of the mind. The idea, as developed in the paper, appears to be that of an intelligent being who is, or becomes, conscious of being absolutely alone in infinite space. There is something of the sublime in the idea, particularly if one accepts Ribot's theory that fear is an essential element in the notion of the sublime.

The writer points out that the part played in the causation of self-destruction by this loneliness of mind is illustrated by the rise and fall of the suicide rate as revealed in history, and as found among the various states and conditions of mankind.

Suicide, he says, is less frequent among barbarians than among the civilized, less frequent among those living in rural districts than among those dwelling in cities, less frequent among Catholics than among Protestants. Suicide is a black shadow which follows the culminating moments of civilization.

The barbarian is altogether ruled by customs, superstitions, and moral ideas coming from without himself. With him collectiveness is at the maximum; individualism at the minimum. There is not enough autonomy in the barbarian or primitive man for him to torment himself about the value of his own being in the world. The collective aspect of the mind dominates him. It is not possible for him to experience that agonizing, terrible feeling "of solitude in the midst of his own family and in the midst of his own fellow citizens," which is seen among the insane melancholics and many other civilized wen who are disposed to commit suicide.

Reflection may reintegrate or dissolve the collective aspect of the mind. The two actions are illustrated in the philosophy of Plato and in Stoicism.

The objective idealism of Plato was in many respects the elevation (and development?) of hereditary and traditional convictions by a master of thought. It continued through the times of civil decadence the "ancient interior compact," the rules which uncultivated man had drawn from customs and religion. And it is to be noted that Platonico-Aristotelian teaching formed a constructive and substantial part of mediæval thought, and of Christian and Catholic philosophy.

In Stoicism, which was the philosophy almost official of the Roman Empire, there was a diffused sense of human brotherhood, but there was also a formidable and solitary pride. The *ego*, the individual, stood alone on emptiness and nothing. The god of the Stoic was the mind of the world. It was an impersonal god. And the Stoic, with all his thorny virtues, believed himself to be greater than his god. The Stoic was a tower, superb and solitary. What wonder then that in the end, weary of his strength and wrestling, he believed himself justified in committing suicide and ending it all.

To the East we owe many cults, superstitions and beliefs. To the East we owe the neoplatonism of Plotinus, and finally Christianity, which again linked man by an ideal thread, by a thread of love and of communion with another Individuality, divine and all powerful. The Christian idea of a God of love and goodness, ready to comfort the agonized mind, became a firm and unshakable point in the midst of a suffering world.

With all this ancient history we find many analogues in modern times. From the free examination of Protestantism to the criticism of modern philosophy there has been a constant work of "interior dissolution," a restless, implacable search for supreme moral certitude. This certitude is never attained, but always wished for.

The author sees subjectivism triumphant in all the fields of modern science, art, and poetry. This subjectivism culminated in romantic philosophy, as developed in the writings of J. J. Rouseau, De Vigny, and Châteaubriand, in the *Werther* of Goethe, in some of the works of Victor Hugo, and those of many other authors, where man, the *ego*, raised himself above the world and everything else. It was a solitude imperial, but sad, as every solitude is. In this literature human passions are exalted to absurdity, and every bond of dependence with the past is broken.

The author appears to consider subjectivism (in which is included the idea of egoism) must in the end lead to loneliness and misery, objectivism (which includes the idea of altruism) to happiness and contentedness. "In the work of philosophy, of art, and of science, the artist and the thinker find peace. The man of the world finds it in the universality of work, in the objectivity of work, whatever the work may be, if it be only worthy and directed to the good of all men."—*Jour. of Mental. Science.*

FREUDIAN PSYCHOLOGY.—Maude S. Deland, *Journ. of the Kansas Med. Soc.*, in an effort to show that the Freudian theory is not something unique, bizarre, or different from the science of biology, but is in keeping with modern physiology in considering man as an adaptive mechanism, discusses the experiments of various investigators and reports a personal observation in hypnotism bearing upon the subject.

For years past we have been observing the symptoms of mental disease and perfecting a classification based thereon. This is good as far as it goes, but it is better both from a practical and scientific standpoint to know their etiology. We wish to know the specific causes which operate in the neuroses and the psychoses which present no characteristic brain changes to account for the mental changes in such diseases as manic-depressive insanity, paranoia, neurasthenia, hysteria, anxiety and obsessional neuroses, and perhaps the early stages of dementia praecox. Are they somatogenic or psychogenic?

Some advance a theory of disordered secretion of the ductless glands, others a disturbance of metabolism, or some other vague terms as mental or physical strain, etc.; while another school of investigators, notably Sigmund Freud, are conceiving life as a dynamic force and are approaching the problem from the psychic side.

Before looking at Freud's theories, the writer believes it necessary to get rid of the idea of the dual nature of man and consider him as a biological unit. She notes that some of our greatest scientists consider an idea not as something spiritual and apart from the physical, but as a dynamic force which reacts on the physical.

Reference is made to the work of Sherrington in tracing the integration of the nervous system from the simple reflex to the complex co-ordinations of the brain, from which he concludes that the cerebral cortex is the organ of and for the adaption of nervous reactions; to the work of Loeb who, in his "Mechanistic Conceptions of Life," has shown how certain insects must go to the light even though it means their destruction because of their light tropism; to the work of Powlow, who demonstrated on dogs the conditional reflex, and of Cannon, who demonstrated the effect of the emotions upon digestion, adrenal secretion and the liberation of sugar, and how these latter in turn raise blood pressure, increase muscular contraction, counteract fatigue, and hasten the coagulation of the blood.

The experiments of Crile are then considered in some detail in which he considers men as an adaptive mechanism, and traces his growth, evolution and survival from conception to his death, as well as the history of the race to demonstrate man's adaptation to environment beginning with life in the trees to the use of tools and fire and shelter and means of communication, etc. His two most complete adaptations being those of killing and procreating—the inevitable sequel of the primal needs of self preservation and for the preservation of his species.

The work of Freud, Mesmer, Braid, Janet, Sidis, Prince, and White upon the problems of dissociation, hypnosis and hysteria are referred to, but to Freud is given the credit for first formulating an hypothesis which considers each psychic event as a history, and his work is considered somewhat at length, especially so far as it explains "repression," "conflict," "complex," and "unconscious," the latter of which is exemplified in a personal observation of the author at the state hospital some years ago, when the campaign for woman's suffrage was on and which is reported as follows:

> "I was an enthusiastic advocate of suffrage and the men of the staff were just as ardently opposed—or said they were. At the same time, two of our staff were interested in hypnotism, and Doctor No. 1 hypnotized Doctor No. 2 and told him that at 11 o'clock the next morning he was to go into the front office, take a book from the bookcase and lay it on my desk. At 11 o'clock Doctor No. 2 appeared in the front office, walked about the room, stopped in front of the bookcase, selected a book on mental diseases, threw it on my desk and said, 'There, if you would devote more of your time to studying that book and less to talking suffrage, it would be better for you.' Of course, we gave him the laugh and gave him the explanation of his actions, but even then he had absolutely no memory of what had occurred during the time he was hypnotized. Now, if the commands of the hypnotizer can drive anything completely from the consciousness of the individual, does it seem very hard to believe that when the whole force of the psyche is exerted to repress a wish or emotion it can be driven into the unconscious beyond all power of the individual to recall?"

This experiment also illustrates that we are actuated by motives of which we are unconscious. Doctor No. 2 was impelled by a force he knew nothing about to lay the book on the desk, but he explained the impulse as a philanthropic desire to advise, and he fully believed in his own explanation. This is called the process of rationalization. We are actuated by motives of which we are unconscious, but our explanations are in accordance with our ideas of what is right and proper. This lets us do what we want to do, but by assigning the proper motive permits us to retain our good opinion of ourselves.

BOOK REVIEWS.

THREE CLINICAL STUDIES IN TUBERCULOUS PREDISPOSITION.—By W. C. Rivers, M. R. C. S., L. R. C. P., D. P. H. Tuberculosis Officer Barnsley District, West Riding, Yorks, Late Resident Medical Officer Northumberland Sanitorium and Senior Clinical Assistant Throat Hospital, Golden Square, London. George Allen and Unwin, Ltd., Ruskin House, 40 Museum Street, W. C., London, Publishers. Price 12/6 net in Great Britain.

These studies represent extensive investigations as to the relative frequency of ichthyosis, squint and (non-tubercular) nasal abnormalities in tuberculosis, the object of which is to show that these physical abnormalities are evidences of a tubercular diathesis, hence their presence would be *prima facie* grounds for prophylactic care, and in cases in which tuberculosis of the lungs is suspected but which do not yield characteristic signs and symptoms their existence would be of clinical import. While these conditions may be present in those otherwise strong and apparently in good general health as well as those afflicted with other diseases—even insanity, the author's data shows them to be proportionately much more frequent in consumption, though a general consideration of his work might lead one to the conclusion that these abnormalities are usually accompanied by other vices of organization and hence but evidences of physical inferiority, or, as the psychiatrist might say, degeneracy.

D. S. B.

A CLINICAL MANUAL OF MENTAL DISEASES.—By Francis X. Dercum, M. D., Ph. D., Professor of Nervous and Mental Diseases, Jefferson Medical College, Philadelphia. Second Edition, Revised. Octavo of 497 pages. Philadelphia and London: W. B. Saunders Company, 1917. Cloth, $3.50 net.

This work has been written especially to subserve the needs of the student and general practitioner, the latter of whom, the author states, "has too often looked upon insanity as a subject unattractive, difficult and abstruse, and with which, because of the speculative and ultraphysical character of its theories and explanations, he has no immediate concern."

The author makes a good beginning in meeting these objections by using the following brief, simple and apparently all-sufficient, group classification of insanity:

I. Delirium, confusion, stupor. II. Melancholia, mania, circular insanity (melancholia-mania, manic depressive insanity). III. The heboid-paranoid group (dementia praecox, paranoia). IV. The neurasthenic-neuropathic disorders (psychasthenia), and V. The dementias.

In a sort of cross-classification the author studies those clinical forms which may result from somatic affections, such as infectious diseases, intoxication, disorders of metabolism, ductless glands, etc., and again in a separate chapter, studies them as related to age.

A chapter is devoted to a residue of mental cases, which, though not classified among the insane, are clearly and definitely abnormal, among which are certain unsuccessful individuals, the misfits of society, the immoral, the vicious, and the criminal.

A chapter is given to the psychologic interpretations of symptoms which is as comprehensive as it is valuable and timely.

The chapter on treatment, including prevention, is especially practical, since, to the strictly medical treatment, is added advice upon commitment, general care of the patient, diet, forced feeding, etc.

The work is up-to-date, as indicated by the discussions on such subjects as the possible rôle of the ductless glands in insanity and the value of salvarsan in paresis, with the various methods of its administration.

The work appears to the reviewer to fully meet the expressed expectations of the author and, hence, the needs of the practitioner. D. S. B.

LOCOMOTOR ATAXIA (TABES DORSALIS): AN INTRODUCTION TO THE STUDY AND TREATMENT OF NERVOUS DISEASES, FOR STUDENTS AND PRACTITIONERS.—By William J. M. A. Maloney, M. D., (Edin.), Fellow of the Royal Society of Edinburgh; Fellow of the New York Academy of Medicine, etc., etc. Illustrated. D. Appleton & Co., New York and London, Publishers.

In this work the author correlates etiology with our anatomical, pathological, physiological and psychological knowledge with reference to the treatment of locomotor ataxia.

The author accepts the modern view that "no syphilis no locomotor ataxia," and gives as factors contributing to locate the disease in the nervous system; poisons, such as alcohol and tobacco, which lower the vitality of the nervous elements, and constitutional, environmental and occupational influences which render the nervous the most vulnerable system.

The author discusses the reasons why the sensory neuron is the more frequently attacked by the spirochete; the rôle of the vegetative nervous system; the influence of pre-tabetic antisyphilitic treatment upon the later appearance and course of tabes; the influence of the various drugs usually used in its treatment, as well as treatment by rest, exercise, training, etc., but the most interesting, because of its novelty, is the import assigned to the psychological element in both the causation and treatment of tabes. The author believes "most of the weakness of tabes is mental, not muscular."

Two chapters are given to the treatment of the motor symptoms of tabes by mechanical supports, foot braces, shoes, exercises, etc., which must be read *in toto* to obtain a proper conception of them.

Aside from the innovations which may require more extended observation to demonstrate their efficiency, the work is such an exhaustive study of tabes and contains so much practical up-to-date knowledge, that the physician who is engaged in treating tabetics can scarcely afford to be without it. D. S. B.

THE MASTERY OF NERVOUSNESS BASED UPON SELF-RE-EDUCATION.—By Robert S. Carroll, M. D., Medical Director, Highland Hospital, Asheville, North Carolina. The MacMillan Company, New York City, Publishers.

This work has for its object the education of the laity—a commendable motive, the subject being an especially practical theme and handled entertainingly and should be of practical value if read and properly digested; however, there may be a doubt as to its proper interpretation by the lay readers.

Notwithstanding the author's note on the paper covering, that: "The physician who recommends this work to his patient will find it a valuable assistant to supplement his treatment," it is possible the patient may interpret the text as "all sufficient," and that it will erroneously supplant the personal advice and treatment, and above all, the individualization, of the physician.

Further, although the author states that "the seriousness and helplessness of the condition of many of the nervous is due to the unfortunate fact that exhaustion of the nervous energy usually reduces will power, consequently the very motive force which is essential to rapid recovery is lacking," the lay reader is apt to obtain the erroneous idea that the will, which is the result of the activity of the brain, can control the brain from which the will derives its own power.

The following quotation apparently indicates medical nihalism:

"The thoughtful reader has long since divined the essential and fundamental truth that nervous cure is self-cure. . . . Powder and pill, elixir and salve, tincture and infusion, are usually but makeshifts more or less weakly or harmfully modifying symptoms only. The truly intelligent physician will tell you that the large majority of the medicines he prescribes produce no change whatever in either the quality or action of the tissues of the body; that only a small per cent. of drugs used have the most accurate scientific investigations been able to show definite physical or chemical action. The effects of the majority of the medicines are produced upon the patient's mind."

A seriously objectionable feature in the application of psycho-therapy is that the lay patient often obtains the idea that his ailment is not only mental, but really imaginary (*i. e.*, uncontrollable automatic neuron activity—truly a delusion, therefore pathological), for which treatment is useless, hence the necessity for special emphasis upon the relation of "mind and matter," as well as information regarding the discriminating application of psycho-therapy, physio-therapy and pharmaco-therapy in perversions of the mind.

Such a work as indicated, should receive unqualified endorsement.

D. S. B.

Nervous and Mental Diseases: Volume X of the Practical Medical Series.—Edited by Hugh T. Patrick, M. D., Professor of Neurology in the Chicago Polyclinic, etc., and Lewis J. Pollock, M. D., Instructor in Nervous and Mental Diseases, Northwestern Medical School, Chicago. The Year Book Publishers, 608 South Dearborn St., Chicago, Illinois. Price, $1.35.

This volume completes the series for 1917 of these handbooks which are issued at intervals of about a month and cover the entire field of medicine and surgery. Each volume is complete on the subject of which it treats for the year prior to its publication.

Though the series is published primarily for the general practitioner, the arrangement in several volumes enables those interested in special subjects to buy only the parts they desire.

This volume is an epitome of selected contributions to the literature on nervous and mental diseases and though, as with the entire series, designed especially for the general practitioner, it is a handy remembrancer and reference for the neurologist and psychiatrist.

D. S. B.

The Alienist and Neurologist

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THE MECHANISM OF PAIN.

Part I.

Pathological Pain and Tenderness with Suggested Re-Classification of the Peripheral Nerves.

By

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FROM the dim beginnings of medical history pain has been the one thing above all others that drove mankind to seek the services of the physician. The profession as we know it to-day owes much of the esteem in which it is held by the laity, if not indeed its very existence, to this obtrusive symptom and the capacity of the medical man to relieve it. Notwithstanding all this the meagerness of our definite knowledge concerning the mechanism of pain is little short of amazing.

Pain has been aptly described by Sherrington (1) as the psychic adjunct of the noci-ceptive reflex. The afferent arcs in this type of reflex transmit impulses initiated by stimuli that are, potentially or actually, of a nocuous nature. Withdrawal from, or removal of, the stimulus and not the accompanying painful affect, is the prime object in this type of reflex (protective reflex). This is shown readily in the "spinal animal" where the motor response to noci-ceptive stimulation is prompt, although the painful affect is by the very nature of the case excluded. In cases of *paraplegia in flexion*, resulting from compression of the cord to a degree that *almost completely* severs all functional relations with the brain, sensation for all ordinary forms of stimulation may be completely lost, yet a mild stimulus, such as stroking the sole, or pressure on the calf, will evoke the flexor-flexion reflex of which the Babinski phenomenon is now believed by many to represent a residual response. Cases 18, 18a. And indeed daily experience shows that in the normal human being the reflex response, *e. g.*, withdrawal, often actually precedes the perception of the accompanying painful affect. This latter, therefore, cannot as such have for its object the direct and immediate control of the spinal protective reflex but forms an essential part of more complex mechanisms which, at higher levels, through education and experience, protect the animal in a way far different from that of the simple spinal reflex and far more effectively. Compare the projicient receptor mechanisms, *e. g.*, those of sight and hearing which, with the aid of the mechanisms of locomotion, enable an animal to avoid injury without coming into actual contact with the nocuous object; and the still further elaboration which affords protection in its widest scope through memory, foresight, comparison, judgment., etc. Here must be emphasized the fact that in the simple spinal reflex afferent impulses are capable not only of activating the muscles directly involved in the act, but also, at the same time of inhibiting their antagonists. Precisely how this latter is effected is not known, for the intimate nature of inhibition is as yet but little understood (Sherrington (1). It is certain, however, that it is brought about at the lower levels *independently* of the accessory cerebral paths developed in association with the afferent arcs for the purpose of mediating sensation (pain, etc.). This point shall be reverted to when we come to discuss the inhibition and control of the thalamic mechanism.

This paper is based on results obtained from sensory studies by quantitative methods in lesions (1) of the peripheral nerves, (2) of the posterior nerve-roots, (3) of the spinal cord (intra and extra medullary), (4) of the pons and root of the fifth cranial nerve, (5) of the thalamus, and (6) of the supra thalamic paths and cerebral cortex. Because of the complexity of the subject the author feels it expedient to state briefly and directly his main conclusions in the form of broad principles many of which must seem to the initiated to be almost axiomatic.

(1) *Pain is of the Nerves.*—This must be obvious to all familiar with the physiology of the nerves whose chief function is conduction. Wherever there is pain the nerves are affected. If there be pain associated with some pathological process then the nerves or their receptors must of necessity be involved in that process. In cases of myositis, cellulitis, periostitis, etc., the nerves either are directly involved or indirectly through the action of toxins upon the peripheral arborizations. Cases 6, 7, 8 and 9. Compare the absorption of toxins by the peripheral nerves in tetanus, etc.

(2) Distinction must be made between the effects of occasional and moderate excitation by noci-ceptive stimuli and those resulting from gross injury of the tissues whether by trauma or disease. The pain incidental to the former may be called *physiological*, that incidental to the latter *pathological*. These two conditions stand in marked contrast to each other; physiological pain appearing at once and only on the application of a nocuous stimulus, whilst pathological pain usually has a period of incubation immediately following the primary stimulation incidental to injury of the tissues. During this period pain and tenderness are practically absent and it is only after the lapse of perhaps hours, days and even weeks depending on circumstances, that spontaneous pain—intermittent or remittent—appears, preceded by the closely allied condition known as tenderness in which pain is evoked by stimulation such as pressure, movement, etc. (Cases 1 to 6.) In any case of injury of tissues, nervous or other, both kinds of pain are encountered. In such conditions the early pain is of the physiological variety dependent on direct stimulation of but slightly injured (irritated) nerves (*e. g.*, air contact in superficial burns) or indirect stimulation through such reactionary phenomena as congestion, etc. The pathological type of pain or that dependent (as we shall see) on a block in conduction appears usually only after an incubation period. Many evanescent "root-pains" associated with neoplasms and other cord conditions are at first of the physiological variety.

(3) In true organic pain or that resulting from injury of tissue, the factor immediately initiating consciousness is a discharge of neural energy along the central sensory pathways. In injury of peripheral tissues, nervous or other, it is readily accepted that impulses streaming inward along the sensory neurones related to the injured or diseased area are the immediate excitants of pain. But as section of the sensory nerves (peripheral to the dorsal root ganglia) not only fails to give permanent relief in such painful conditions as trifacial neuralgia, but in normal individuals may actually lead to conditions of extreme pain and tenderness (Cases 1, 3); whereas

section of the posterior nerve-roots (proximal to the dorsal root ganglia), or section of the pain-paths anywhere in the spinal cord or brain-stem affords permanent relief, it is evident that the mechanism responsible for the impulses immediately exciting pain must lie in the dorsal root ganglia, *i. e.*, in the sensory neurone bodies. Pain and tenderness at the periphery are a possibility as long, and only so long, as these mechanisms are intact and in functional relation with the optic thalamus. Where pain and tenderness are of central origin, *e. g.*, in certain lesions of the thalamus, the cases studied show that here also the functioning of the dorsal root ganglia cells and of their paths of communication with the thalamus is a *sine qua non.* (Cases 18, 19, 21.) Hence in the neurone bodies of the pain-paths lying in the dorsal root ganglia or in their analogues in the cranial nerves, reside the chief dynamic factor of the mechanism of spontaneous pain and tenderness.

(4) Pathological pain and tenderness are always associated with some marked defect in the initiation and conduction of impulses. This defect is always more in evidence in the critical elements (touch, localization, size, shape, weight, form, texture, consistency, posture, passive movement, compasses, etc.) as opposed to the affective elements (hurt, pain, discomfort, etc.) although these latter may exhibit marked variation of threshold (usually raised) even in acutely painful conditions. This defect in the critical elements has been encountered in all conditions exhibiting pathological pain and tenderness, *e. g.*, in lesions of the thalamus, brain-stem, spinal cord, and peripheral nerves; in infections (felon and empyema thoracis) and following trauma of all grades from the slight erythema induced by a mustard plaster to the crushing and cutting of tissues.

It is a curious fact, emphasized recently by Elsberg that tumors or injuries of the posterior funiculi, unless they involve the posterior nerve roots, are not associated with pain, whereas growths, intra- or extra-medullary, which compress the posterior nerve roots are invariably accompanied by pain. Small lesions compressing the posterior funiculi do not of themselves cause pain because such lesions cannot effectively interrupt the critical pathways which pass brainward, partly in the antero-lateral column of the contra-lateral side, and partly for a distance covering in some instances as many as 8 or 10 segments in the posterior funiculi of the side of entry. The paths for compasses and for posture and passive movement do not cross until they reach the decussation in the medulla (*n. gracilis et cuneatus*). These factors render it impossible, as Head has pointed out, for a simple lesion severing the posterior funiculi or indeed for any lesion of the cord, *e. g.*, stab wound or neoplasm, other than one involving the posterior column on one side and the anterio-lateral column of the opposite side, to completely destroy critical sensibility in any particular area at the periphery. Lesions that effectively compress the cord from without can abolish critical sensibility, but to effect this the extent and intensity of the compression has to be so great that the superficial affective elements (prick, etc.) are also suppressed. Hence the infrequency with which "protopathic sensibility" is encountered in such lesions.

The paths next affected by such a lesion are the deep critical. When these are interrupted, dissociation, with over-reaction, etc., appears, the deep affective system being the most difficult of all to interrupt under such conditions. Compare cases 18, 18a, and 21. In some of these cases of cord compression from without, though specific sensation for gross heat and cold may be absent for ordinary degrees in massive application, *e. g.*, ice and 55° C., yet a temperature of 70° C. carefully applied for some time to the soles will evoke the sensation of heat (Cases 18, 18a). This shows that the paths for the critical elements (including specific sensation) are only functionally interrupted for ordinary stimuli whilst those for the grossly affective elements remain open. In the brain-stem the critical paths having all crossed over, lie close together on the same side and may be readily interrupted by compression whilst the older and more resistant affective paths remain practically unaffected. Compression in this region, *e. g.*, neoplasm resting on the pons, medulla, and fifth nerve root on one side readily causes "alternating anesthesia" accompanied by spontaneous pain, over-reaction for nocuous stimuli, etc. (Case 20.) Intra-medullary cord lesions, *e. g.*, syringo-myelia, neoplasms, etc., are not attended by pain unless the posterior nerve roots are involved. In syringo-myelia the affective paths, lying nearest the central canal, are the ones first affected (Case 19); whereas in the case of intra-medullary neoplasms the affective paths, because of their close grouping in the central gray matter and spino-thalamic tract, are more readily interrupted completely for any given area at the periphery than are the critical paths.

In tabes the lesion is primarily in the posterior nerve roots or in the dorsal spinal ganglia. Here critical sensibility, *e. g.*, posture, passive movement, etc., is seriously impaired and the condition is associated with characteristic pains which are readily relieved by appropriate section proximal to the ganglia. (Compare Cases 17a, 17b.)

In many painful conditions, such as "rheumatic joints," or so-called muscular rheumatism, it may be difficult to demonstrate impairment of critical sensibility since the nerves involved are all deeply situated. In such cases the subjective sensory phenomena, *e. g.*, feelings of numbness and "deadness" or "strange feelings" in the joints or elsewhere, are relevant. In some cases of nerve injury, or of nerve section followed by suture, pain and tenderness are not at any time a feature, although critical sensibility may be seriously involved. In such cases it will be found that movement or use of the limb has been a factor in eliminating pain by facilitating conduction in such injured neurones as are capable of conduction or in neurones closely related to them functionally. Compare Case 5 and the effects of early massage, etc., which is as beneficial in certain cases of nerve injury as prolonged immobilization is detrimental. Thus in Case 3a which was studied for two and one-half years after resection and suture of the external popliteal nerve, practically no pain was experienced and there was little or no evidence of a "protopathic stage." This case is, however, exceptional in many ways, *e. g.*, (a) the short distance the regenerating fibres (motor and sensory) destined for muscle had to cover in order to reach their destination; (b) the active and passive movements begun at the earliest opportunity; (d) the perfected surgical technique and the constant supervision by an orthopedist. Immobilization is, however, useful, nay imperative in the early (acute) stage of all painful conditions due to infection of any kind.

(5) The marked analogy between the dissociated sensibility (dysaesthesia, etc.) found in certain lesions of the optic thalamus and that encountered in the regenerative ("protopathic") stage after section or injury of the peripheral nerves suggests a close relationship between the two sets of phenomena. In the regeneration period after nerve-section and suture the peculiar type of sensibility called by Head "protopathic" makes its appearance. The critical elements are absent or markedly impaired, whilst the affective elements (prick, pressure-pain, gross heat and cold) are present with raised threshold and accompanied (when felt) by over-reaction, radiation, poor localization, reference and inability to appreciate the nature of the stimulus. Closely similar, if not identical characteristics mark the conditions of sensibility found in certain lesions of the thalamus (thalamic syndrome). *Lesions compressing the cord and brain-stem may cause dissociations of sensibility similar to those encountered in lesions of the thalamus or of the peripheral nerves.* (Cases 18, 18a, 20.) In Cases 18 and 18a a malignant neoplasm, springing from the vertebrae, surrounded the cord and gradually compressed it until the passage brainward for impulses from all ordinary forms of stimulation was completely blocked. Both cases exhibited the phenomena of paraplegia in flexion. In 18a before operation no ordinary stimulus could be felt although flexor-flexion reflex movements were readily elicited by light stroking of the sole. Extreme pressure on the calves caused pain; massive, more or less prolonged application of heat at 70° C. to the soles also caused pain and discomfort, cold (ice) being much less

effective in this respect. These stimuli were attended by radiation, localization being poor; the nature of the stimulus could not be appreciated and there was but little over-reaction. The absence of marked over-reaction was probably due to the almost complete block of the brain paths in the cord. At operation a neoplasm was found embracing the cord like a ring from the seventh to the tenth segments, the cord and meninges being intact. The neoplasm was removed, after which the patient was studied daily for the return of sensibility. The latter showed evidence of returning after the lapse of six days when vibration (tuning fork) began to be felt in the legs. A short time after this a remarkable phenomenon occurred. The patient suddenly began to suffer from spontaneous intermittent pains, lightning-like in character and referred from moment to moment, to various parts of the lower limbs. With the reappearance of the critical elements the pains became less and less until finally with a fair degree of critical sensibility restored they ceased altogether. Here was direct evidence of the dynamic elements at work in the dorsal root ganglia accumulating energy, presumably as a reactionary response to the cord-block and incidentally resulting in an inward rush of pain-bearing impulses the moment affective conduction became partially restored. And as the pains subsided with the return of the critical elements we have evidence that these latter in some way controlled the affective elements and that this control was not effected in the posterior root-ganglia, nor in the spinal cord, since the lesion was far removed from the lower ganglia and the cord segments directly related to the areas of reference of the most severe pains, viz., the feet and legs. In Case 20 a tumor of the lateral lobe of the cerebellum compressed the side of the pons and medulla and the root of the fifth nerve, causing alternating anesthesia accompanied by spontaneous pains, with over-reaction, etc., for affective stimuli in the anesthetic areas. Dissociation of sensibility as it occurs after injury or suture of the peripheral nerves results from the unequal rate of regeneration of the affective, as opposed to the critical paths, the former regenerating much more rapidly than the latter (Head and Rivers (2). In root lesions, as in tabes or pressure from neoplasms, conduction is more readily affected in the more recently acquired critical paths than in the older, more resistant affective paths. In their course within the thalamus the critical paths are anatomically distinct from the affective and are capable of separate interruption by direct anatomical lesion. Separate interruption may also be effected by pressure from neoplasms (indirect lesion), and by the toxins of certain infections. In these latter conditions the critical paths are the ones most readily affected. In one or other of these may arise the peculiar dissociations (dysaesthesias) encountered in thalamic lesions and perhaps also those found in the so-called reflected pains.

(6) The impulses mediating the grossly affective elements (pleasure, pain, change of state), on arriving at the thalamus are believed by many to enter directly into consciousness at the "essential organ" postulated by Head and Holmes (3) and regarded by these observers as a center of consciousness for the affective elements. From the psychological standpoint such a "center of consciousness" is as objectionable as the now discarded centers of emotion other than the centers for mimetic expression which, of course, are a different matter. In lieu of more specific information it may be accepted that the grossly affective elements of sensation enter into consciousness somewhere in the thalamus. This holds, however, only for the grossly affective (hurt or pleasurable) elements in the case of each stimulus and not for the specific critical elements such as sharpness in prick, and the specific sensations of heat and cold as such. The specific element in each case is intimately associated, at the periphery, with the grossly affective (hurt or pleasurable) element.

It is generally accepted to-day that the paths for the affective elements of prick, heat and cold, after crossing through the central gray matter of the cord, pass brainward in the spino-thalamic tract. It is also accepted that within the spino-thalamic tract the paths for pain, heat and cold are separate. Some observers still maintain that the paths for pain pass brainward in the gray matter of the cord. From the study of a remarkable case of syringo myelia (Case 19) occurring in a young and intelligent subject it was apparent that for such stimuli as prick, and gross heat and cold, the affective or hurt elements were the first to disappear whilst the specific (critical) elements, *e. g.*, of sharpness and of heat and cold as such, were in general practically unaffected. It was further evident that in the cord the paths mediating the affective elements of prick, and of gross heat and cold, are separate and distinct as a whole from those mediating the specific elements. Here the "hurt" elements in passing through the central gray matter must lie closer to the central canal than the specific elements (sharpness, heat and cold as such) where they would be more readily affected by pathological processes originating within or near the canal. But the specific elements themselves were, in a certain region (*e. g.*, over the left thorax) still further dissociated, the specific element for cold being entirely absent whilst that for heat and sharpness was but slightly affected. Here again it seems that the path for the specific element of gross cold lies nearer to the central canal than that for gross heat or sharpness. These facts seem to indicate that the paths for the affective elements of such stimuli as prick and gross heat and cold are older than those for the specific sensations of sharpness, heat, and cold, and that as a whole they lie nearer to the central canal than the paths for these latter and are more readily affected by lesions originating within or near the central canal. The specific element of cold seems to be older or more readily abolished by lesions originating in or near the central canal, than the specific elements of heat and sharpness.

In certain thalamic lesions superficial may be dissociated from deep sensibility for both affective and critical forms. In Case 21 and similar cases which presented all the characteristic features of the thalamic syndrome, there was absolute loss for all forms of superficial and deep critical stimuli, as well as for the superficial affective forms, over the trunk, limbs, and lateral aspect of the face and neck on the right side. On this wide area sensibility was preserved for deep affective stimuli (pressure-pain, rapidly repeated stimulation by a needle somewhat forcibly applied, massive prolonged applications of gross heat and cold). For these stimuli only the "hurt" element was preserved, all specific sensation such as sharpness and heat and cold as such being lost. Localization was markedly impaired and there was wide radiation and reference, with absolute inability to recognize the nature of the stimulus. On the mesial third of the face sensibility for the superficial critical elements was lost whilst that for the superficial affective elements was preserved but so altered that the "hurt" element alone was retained; this latter, when felt, being attended by over-reaction, radiation, and inability to recognize the nature of the stimulus. On this area deep critical sensibility was preserved and deep affective sensibility showed no abnormality. Here we have direct evidence that such specific elements as sharpness, heat, and cold take a different course from that taken by the "hurt" elements and enter into consciousness (tinctured perhaps with a modicum of affect) at another level, presumably in the cerebral cortex. The case, as well as three closely similar cases, thus gave evidence of the existence in the peripheral nerves of four different sets or systems mediating the different elements of sensation, viz.: (1) the *deep affective*, mediating affective stimulation addressed to the deep receptors, *i. e.*, pressure-pain, intense pricking rapidly repeated, gross heat and cold in massive, prolonged application; (2) the *superficial affective*, mediating affective stimulation addressed to receptors superficially situated, *i. e.*, prick, heat, cold, warmth; (3) the *deep critical*, mediating critical stimulation addressed to the deep receptors, *i. e.*, posture, passive movement, pressure-touch, localization (for touch, pain, etc.) compass points applied consecutively, (also simultaneously with firm pressure, *vide infra*) and the specific elements of deep affective stimuli (sharpness, etc., heat and cold as such); (4) the *superficial critical*, mediating critical stimulation addressed to the superficial receptors, *i. e.*, light touch, and its localization, compass points simultaneously and not too heavily applied, perception of, and discrimination between, temperatures ranging about the neutral point (temperature of the skin) and the specific elements of superficial affective stimuli, such as sharpness of prick and the specific sensation of gross heat and cold.

Corroboration of the existence of these four systems was sought and apparently found. Thus Case 14a, which was one of osteomyelitis in which, at operation, the skin from the hip to the knee had been split down to and retracted from the fascia, the muscle also being split in places down to the bone. Careful quantitative tests showed absence of sensibility for gross heat and cold and for prick and pressure-pain, as well as for touch, compasses, and intermediate degrees of heat and cold in the substance of the belly of the muscle, whilst sensibility for these stimuli was preserved in the fascia and membranes overlying the muscles. The insensibility to extreme heat in the muscle substance may possibly have been due to degeneration of the nerve filaments in the superficial exposed portion. Compare Case 17b, etc. In these structures, (fasciae, etc.) the superficial critical elements were absent (light touch, moderate degrees of temperature ranging about the neutral point, *e. g.*, 23° to 30° C. and 36° to 40° C.), but certain critical elements were preserved. Thus pressure-touch and its localization were well preserved and the answering for the compass tests was quite good with the points two and one-fourth inches apart and applied both simultaneously and consecutively. The specific element for gross and intermediate degrees of heat and cold, though markedly defective, compared to normal skin sensibility, showed nevertheless a considerable degree of sensibility. In Case 17b in which the third, fourth and fifth sacral nerve-roots had been resected at operation, the superficial critical elements were absent over the third sacral root area on the buttock whilst the deep critical elements were preserved (pressure-touch and its localization, compasses consecutively applied, and the specific elements of gross heat and cold in prolonged, massive application). In further tests the structures beneath the insensitive skin were directly stimulated by means of a needle. This in places caused pain when the deeper structures (fascia or periosteum but not muscle) were reached, the nature of the stimulus being fairly recognized. Injections of normal salt solutions were made at 60° to 70° C. and near 0° C. These caused pain which was well localized when injected into or near the deep fascia. Injected into the muscle the hot solution caused pain which was described as stinging. The cold solution caused no pain. No specific sensation was felt for hot or cold solutions injected into the muscle. Injected into or near the fascia the element of heat was felt especially for ranges between 45° and 55° C. No specific sensation was felt in the case of cold. These findings were corroborated in tests made on normal individuals. They also find support in the experience of surgeons, operating with local anesthesia, muscle substance and bone being insensitive to the knife whilst the fascia, periosteum and its equivalent, the dura mater (in the skull) are very sensitive. Compare Case 24a. In Case 21 (thalamic lesion with typical sensory phenomena) a needle passed through the skin did not cause pain until the fascia was reached, when there was over-reaction, spreading, etc. The muscle substance was insensitive to the needle point and to cold (near 0° C.) isotonic solution, but exquisitely sensitive, with spreading, etc., to heat at 60° to 70° C. The fascia was similarly sensitive to these degrees of heat but insensitive to cold. At no site in skin, fascia, or muscle could the nature of the stimulus (specific element) be recognized.

These findings seem to warrant a reconsideration of Head's division of the peripheral nerves into three systems, viz., epicritic, protopathic, and deep. These terms have been found extremely confusing to students and teachers alike, more especially when set beside Sherrington's division into the extero-ceptive, entero-ceptive and proprio-ceptive fields and systems. The author's division herewith suggested into the critical and affective systems, each being subdivided into superficial and deep sets, seems simpler and will perhaps prove more convenient for clinical purposes.

In their order of development the affective system precedes the critical. The first step in the development of the latter is the acquisition of control over the former, the end result being poise and a sense of security born of perfected orientation. Compare the visceral sensory system in which the superficial elements, critical and affective, are undeveloped, the only critical elements present being the specific elements of gross heat and cold (in massive application) and those for pressure pain (quality and other characteristic). Compare also the reversion in the motor system to the flexor flexion phenomena and in the somatic sensory system to a state of sensibility resembling that of the viscera in cases of cord compression from without by neoplasms and in the thalamic lesions just discussed.

(7) It is evident that in normal sensibility we have a complex mechanism in which the activities of the neurones mediating the affective elements are nicely controlled and adapted to the needs of circumstance by the activities of the critical neurones. The exact point at which the critical exert their influence upon the affective neurones is, to some extent, a question. Lesions of the cerebral cortex may cause impairment of the critical elements coupled with marked variability of threshold leading to uncertainty and unreliability in the responses to the sensory tests. But such lesions do not give rise to the characteristic thalamic phenomena (over-reaction, etc.). In Case 22 following fracture of the skull over the right post-rolandic area, complicated by erysipelas of the scalp, the patient showed marked disturbances of critical sensibility. After recovery from the injury parathaesiae of one-half of the body appeared. These after a lapse of time showed a tendency to subside so that on examination eight months after the injury, the chief complaint was paraesthesiae of the left leg and foot ("pins and needles," "burning," etc.). The lesion had evidently remained stationary for some months. In testing for critical sensibility at this time it was found impossible to establish a threshold for various critical stimuli (superficial and deep) on the affected side though a threshold was readily established on the sound side. For certain components of the affective forms there was marked impairment; thus on the left hand and foot there was at times marked inability to distinguish the head from the point of a pin (acuaesthesia). Localization for superficial and deep stimuli was impaired. This was significant in-as-much as there was marked spreading (radiation) in the leg for such affective stimuli as pressure-pain, heat and cold. The specific sensation for heat and cold was replaced, in the case of heat largely, and in the case of cold totally, by a sensation of "burning" which was the most prominent of the paraesthesiae. There was no over-reaction for any of these stimuli with the exception of gross cold applied to the trunk, and the over-reaction then was not more than what is encountered in normal individuals. The case shows that cortical lesions abolishing, or profoundly disturbing the critical elements do not necessarily give rise to the characteristic thalamic phenomena (over-reaction, etc.). Case 23 shows further that lesions of the posterior (sensory) portion of the internal capsule and of the lateral aspect of the dorsal half of the posterior portion of the thalamus, although causing disturbances of critical sensibility closely resembling those found in Case 21, do not cause the characteristic thalamic sensory phenomena (over-reaction, etc.). It is to be noted, moreover, that lesions in other parts of the cortex, or of the thalamo-cortical paths, are not associated with the characteristic phenomena. The control of thalamic over-reaction which Head and Holmes (3) attribute to the cortical mechanisms does not seem, therefore, to have the support of clinical and pathological fact. We have seen, moreover, that the critical mechanisms do not influence the affective, in the cord or dorsal root ganglia (Cases 18, 18a) and there is no apparent reason for believing that they influence them in the brain-stem or mid-brain. We are, therefore, driven to the conclusion that *the site of incidence and influence of the critical upon the affective mechanisms is in the thalamus itself.* Compare the phenomena of reciprocal innervation in which, in a "spinal animal," the antagonists are inhibited through the

afferent arcs, though the offshoots from these that carry the pain impulses brainward are totally severed.

That lesions of the thalamus cause a rather clean-cut dissociation is certain, as was first pointed out by Dejerine and his co-workers (6), just as it seems certain that the impulses immediately causing the pain, over-reaction, etc., in thalamic and peripheral nerve lesions must originate in the dorsal root ganglia (pain neurones) since the characteristic dissociation of sensibility with its pain, over-reaction, etc., never appears following complete interruption (proximal to the dorsal root ganglia) of the pain paths. The facts, therefore, seem to indicate that the fundamental dynamic mechanism of affective sensibility resides in the bodies of the pain bearing neurones lying within the dorsal root ganglia and in their analogues in the cranial nerves, and that the mechanism of critical sensibility exerts its influence in the thalamus where, by the means of collaterals or main-stems, it impinges on the mechanism of affective sensibility controlling this latter and co-ordinating it according to the needs of circumstance. Such a mechanism does not preclude the existence of cortical mechanisms which, under certain circumstances, may inhibit thalamic function. Compare the *diaschisis* of von Monakow and the inhibition of pain by diversion of the attention and in conditions of abstraction, hypnosis and the like. These phenomena, however, are exceptional and open up a question altogether different from the one under consideration. Figure 1, made to illustrate Case 21, depicts diagrammatically the relations in the thalamus of the critical and affective mechanisms and the manner in which lesions may induce

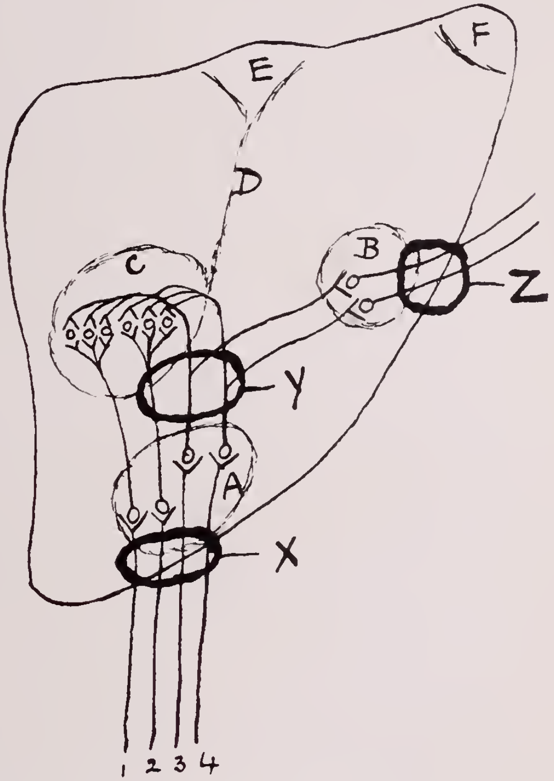

Fig. 1. Showing mechanism of sensory dissociation in lesions of the optic thalamus.

the characteristic dysaesthesia, over-reaction, etc. A is the posterior nucleus (ventral-posterior division of the lateral nucleus of von Monakow); B the lateral nucleus (ventral-anterior division of the lateral nucleus of von Monakow); C, the "essential organ" postulated by Head and Holmes (3) corresponding in the diagram with the site of the mesial nucleus; D, the internal medullary lamina bifurcating above to include E, the dorsal nucleus; F, part of the caudate nucleus. The numerals represent the separate systems of afferent nerves; 1, the deep affective; 2, the superficial affective; 3, the deep critical; 4, the superficial critical (epicritic of Head and his colleagues). A lesion such as that represented by the heavy ring at X would destroy all the elements of sensibility. A lesion such as Y would give dissociation identical with that observed on the lateral portion of the scalp and face and on the trunk and limbs as found in Case 21. A lesion such as Z would interrupt all the elements of critical sensibility and specific sensation but would not of itself cause the characteristic loss of thalamic control since critical main-stems or collaterals still reach the essential organ and control it. Compare Cases 22 and 23 where the critical elements were impaired in the cortex and in the thalamo-cortical paths without impairing thalamic control. Compare also Cases 18 and 18a where the spinal reflexes (flexor-flexion, etc.) were still activated by afferent impulses from the periphery though all the cerebral paths mediating sensation were completely blocked. Possibilities for other types of lesions are readily suggested by the diagram.

It seems probable that the deep critical mechanisms control largely the deep affective mechanisms and the superficial critical the superficial affective. Compare Case 21 where deep critical sensibility was preserved on the mesial third of the face, deep affective sensibility being unaffected. Compare also Case 18a where, with the return of deep critical sensibility in the calf, the over-reaction and radiation for pressure-pain disappeared, superficial critical and affective sensibility having not as yet returned.

(8) The critical pathways (collaterals or main stems) pass, after relay in the lateral nucleus of the thalamus, to the cerebral cortex. A break in the critical pathway such as would lead to impairment or abolition of the control exercised normally by the critical, over the affective mechanisms, may occur at any of the following levels: (1) In the peripheral nerves distal to the dorsal root ganglia, *e. g.*, severance of the sensory nerves or trauma, more especially where this is followed by infection and the formation of adhesions, scar tissue, etc.; products of inflammation, any focus of pus under tension being capable of causing dissociation of sensibility by absorption of toxins through the terminal arborizations (Cases 6, 7, 8 and 9), the critical paths being the first to succumb.

(2) At the dorsal spinal ganglion and the posterior nerve roots, from pressure, inflammatory change as in tabes, etc.

(3) In the cord, from gradual progressive compression from without.

(4) In the brain-stem, pons, medulla and upper cord, from compression by relatively small neoplasms, etc.

(5) In the thalamus from lesions, direct or indirect (pressure), toxins, etc.

(9) Certain elements, as we have seen, associated with affective sensibility and apparently of the nature of simple percepts involve, nevertheless, comparison (at least against the general background of coenaesthesia) and judgment, and are undoubtedly related to cortical function. To this extent these must be regarded therefore as critical elements. Of such a kind are the quality and gradation of the specific sensations evoked by all forms of affective stimuli, *e. g.*, the sensation of sharpness and of heat, and cold as such apart from a certain more or less undefined pleasure or discomfort (essential affective element) invariably induced by all affective stimuli (Case 21). This, of course, does not necessarily contravene the view that primarily and fundamentally the paths for gross affective sensibility as such end in the thalamus. In several cases of post-traumatic epilepsy discharge of neural energy from the sensori-

motor areas of the cortex as the result of meningo-encephalitis, demonstrated at operation in Case 24, caused sensations described by the patient as of pain (sharpness) heat or cold. Occasionally the "painful" attacks, *e. g.*, in the hand or foot, culminated in localized spasms and even in general convulsions. The sensations in this instance comprised the critical elements only and were not in any way comparable to the affective phenomena (pain, over-reaction, etc.) encountered where dissociation occurs at or below the level of the thalamus. (Compare Cases 22, 23.)

(10) The much disputed question as to whether, apart from the different types of receptors which often seem to be communal in function, the pain-paths in the peripheral nerves are separate and distinct from the critical paths need not detain us. Ranson (4) by his pyridine modification of Cajal's silver stain seems to have proved that the pain-paths are a distinct and separate entity consisting of non-medullated fibres, whereas the fibres mediating critical sensibility are medullated. Compare Case 19 (syringo-myelia) where, in a cord lesion, there was complete dissociation of the "hurt" from the critical elements of sharpness and of heat and cold as such.

Conclusion.—In normal conditions the stream of impulses coursing inward from the periphery along the paths mediating critical sensibility and constituting the basis of our general sense of being (coenaesthesia) constantly influences the anabolic and catabolic processes in the mechanisms of affective sensibility, *i. e.*, in the primary sensory (pain) neurones and especially in that portion of them (the neurone bodies) situated in the posterior root ganglia. The point at which this control is exerted seems to be in the optic thalamus. By means of this control a nice equilibrium between anabolic and catabolic activities is maintained in the affective mechanisms and a reasonably adapted threshold of stimulation secured with consequent reaction proportioned to the nature and intensity of the stimulus. Where the control of the critical mechanisms is removed by injury or disease, or by impaired conduction in the affective paths, then irregularity in the anabolic and catabolic processes of the affective mechanisms sets in, presumably in the interest of regeneration and restoration of function, with consequent over-storing of neural energy (neural potential) and spontaneous or readily elicited discharge of afferent impulses which are the immediate cause of pathological pain and tenderness. The neurone body, under normal conditions, as a reservoir of energy (kinetoplasm) may be compared to the battery interpolated in the telephone circuit. It aids in making the faint changes initiated at the transmitter registrable at the receiver. For this purpose batteries of a certain (optimum) strength are necessary, depending on conditions of resistance, etc. The neurone body, however, differs in one important respect from the telephone battery in that it is a biological unit and as such capable of self-replenishment and adjustment. When, therefore, the resistance is unduly increased or the circuit actually broken, and in all cases of dissociation the affective neurones are, to a greater or less extent, blocked or interrupted, we find the neurone body "reacting" by accumulating and expending abnormal amounts of energy to facilitate repair and the restoration of function (hypermetabolism). The fact that an abnormal rush of impulses reaches the brain at times, causing pain, is perhaps a mere incident to the main objective which is restoration of neural continuity and function. This conception of the over-storing and discharge of neural energy is not novel to laboratory workers and clinicians. Witness the outburst of nerve-cell impulses observed by Langley (5) after blocking by nicotine and the phenomena of after contraction in the urinary bladder which Langley, recalling Nernst's theory (ion concentration) attributes to just such neural overflow; compare also the current theory of Gowers as to the immediate cause of epileptic convulsions and allied phenomena.

The author, realizing the magnitude of his subject, has merely outlined the skeleton of his hypothesis, leaving to others the work of applying it in detail to particular conditions. The neural chemistry of pain has been left untouched although there are reasons for believing that the phenomenon of allergy plays an important rôle in the mechanism of general and localized pain, more especially in the so-called rheumatic affections. The hypothesis of neural hyper-storage and overflow is applicable to innumerable conditions but especially to visceral and cardio-vascular affections associated with paroxysmal or anginoid attacks. Compare the phenomena of paradoxical pupil-dilatation and prolonged arterial contraction that follow, after a period of incubation, anatomical or, as the author's experiments conclusively show, mere functional discontinuity of the cervical sympathetic in rabbits, cats, and other animals.

The author gratefully acknowledges his indebtedness to the work of his predecessors and especially to the brilliant work of Dr. Henry Head, whom he wishes to thank for courtesies extended to him at the London Hospital and for initiating him personally into the methods of making the sensory tests. His acknowledgments are also gratefully tendered to Drs. Chas. L. Dana, Alfred S. Taylor, John H. Larkin and the various members of the Visiting and House Staffs of the Fordham and Central Neurological Hospitals for the opportunity of seeing many of the cases studied and for the kindly encouragement and active assistance at all times freely given him in his work. Finally, the authorities of Fordham University must be thanked for generously placing at his disposal both laboratory and clinical facilities without which these studies could not have been made.

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APPENDIX.

Summary of Cases Studied.

(1) Lesions of the Peripheral Nerves.

(a) Traumatic.

(1) W. T. Resection of the ulnar nerve for neuro-fibroma; true hyperalgesia following surgical injury of the median; superficial critical sensibility impaired and affective threshold raised on hyperalgesic area.

(1a) W. MacR. Fracture of tibia; true hyperalgesia (causalgia) of sole from callus pressure on posterior tibial nerve; superficial critical sensibilty impaired; threshold raised for superficial affective stimuli with over-reaction, radiation, etc., when felt.

Query: What caused the hyperalgesia? "Irritation" of the nerve trunk? This does not account for the heightened affective threshold and the spreading and over-reaction. After compression something happened in the mechanisms proximal, not at or distal to the point of pressure, causing them to over-respond to affective stimuli once the threshold was reached.

(2) M. S. Median hyperalgesia following Colles' fracture with contusion of the ulnar nerve.

(3) S. E. Severance of radial branch in forearm; no spontaneous pain for four weeks and then pains intermittently for seven years; small neuro-fibroma .5 cm. from distal extremity of proximal stump; resection and *suture à distance;* unusually rapid recovery of affective and critical sensibility (12½ weeks for compass points simultaneously applied); relief from pain from the time of operation.

(4) J. B. Contusion of third digital branch of radial; critical sensibility impaired on area of distribution; on stretching nerve by hyper-extending elbow and

wrist, painful feeling in sensitive area as if stuck with a bundle of red hot needles; recovery.

(5) J. B. Contusion of great toe (stepped on by horse); no pain after injury; later, on walking, pain (physiological variety) felt at each step; no pain on resting; cold douche with force (massage) followed by sleep for one hour; on awaking with the first movement severe pain set in and lasted 15 minutes when it disappeared and did not return.

(b) Toxic or Infective.

(6) J. B. Cat bite of index finger; only momentary physiological pain felt at time of injury; two hours later secondary physiological, throbbing pain (congestion); one week later spontaneous pathological pain which was relieved by evacuation of a drop of pus.

(7) L. G. Felon of thumb; ineffective evacuation of pus followed by intense inflammation (osteo-periostitis); marked impairment of critical sensibility accompanied by intense pain and tenderness in the radial and median nerve areas; amputation of terminal phalanx; 20 hours later the spontaneous pains had disappeared, but tenderness persisted for some time with some impairment of critical sensibility.

(8) T. McG. Felon of thumb studied from its inception; pain, tenderness and over-reaction, etc., for affective stimuli accompanied by impaired critical sensibility in the radial and median areas; almost immediate cessation of abnormal sensory phenomena following effective evacuation of a single drop of pus. Chart I. The light shading shows loss for the superficial critical forms, viz., light touch, compass points simultaneously applied, heat at 40° C. and cold (impaired only) at 22° C. The heavy dotted line bounds area in which sensibility for prick and for gross heat and cold was exalted, these stimuli, when felt, being attended by over-reaction, radiations, etc. The interrupted line bounds area of impaired sensibility for prick; the evacuation of a drop of pus restored normal sensibility almost at once.

(9) P. W. Empyema thoracis; pain (on coughing or moving) and tenderness in area of distribution of the anterior divisions of the 8th, 9th, 10th and 11th thoracic nerves; critical sensibility impaired over this area; spontaneous rupture through old scar and immediate disappearance of the abnormal sensory phenomena. Chart 2. Light shading indicates area of impaired sensibility for the superficial critical forms (light touch, heat at 40° C., etc.). Heavy interrupted line bounds area in which sensibility was impaired for 22° C. and for ice, being moderately exalted for prick, pressure-pain and 55° C., all of which were accompanied by over-reaction, radiation, persistence and stinging. Heavily dotted line bounds area in which sensibility was markedly exalted for all forms of affective stimulation and for light touch (finer von Frey hairs) as well as for 38° C. and 25° C. possibly corresponding to a maximal area of reflected pain. The loop at the upper boundary of the anesthetic area in the back represents the old scar which spontaneously gave way. With very imperfect drainage the abnormal sensory phenomena quickly disappeared.

(10) S. G. Trifacial neuralgia; tooth infection; critical sensibility impaired in distribution of the infra-orbital nerve accompanied by hyperalgesia with over-reaction, radiation, etc., for affective stimuli; cutaneous hyperalgesia on both sides present at all times during the examination over the *maxima* of Head's mental, hyoid, and parietal areas and over the entire mid-orbital area; just after a paroxysm intense hyperalgesia over the entire distribution of the 5th nerve on scalp and face on affected side; removal of tooth-root and drainage cured. Chart 3. The large shaded area under the right eye showed impairment for light touch, localization and compass points simultaneously applied; impairment for prick (algesimeter at 2 and 4 grams pressure) sensation when evoked being attended by over-reaction, radiation, etc.; impairment for 38° C. and for 55° C., the latter being attended by over-reaction when felt. For 22° C. sensibility was variable, being in the main exalted. The shaded areas above and below

the eyes and high on the forehead (mid-orbital), below the angles of the mouth (mental) and in front of the ear lobes (hyoid, in part) represents the *maxima* of Head's areas of cutaneous hyperalgesia associated with reflected pains. These areas were hyperalgesic between paroxysms. Just after a paroxysm the whole face and scalp on the right side became hyperalgesic.

(11) Mrs. C. Trifacial neuralgia; maximal pain in gum from which tooth had been removed some years previously; x-ray, no roots, etc., visible; no impairment of critical sensibility demonstrable (poor subject); cured by rest and anti-rheumatic measures; relapsed after months; cured again.

(12) V. L. Trifacial neuralgia; critical sensibility impaired over distribution of the three divisions of the 5th nerve; for affective stimuli threshold raised with over-reaction, radiation, etc.; removal of an impacted wisdom tooth in the upper jaw; cured.

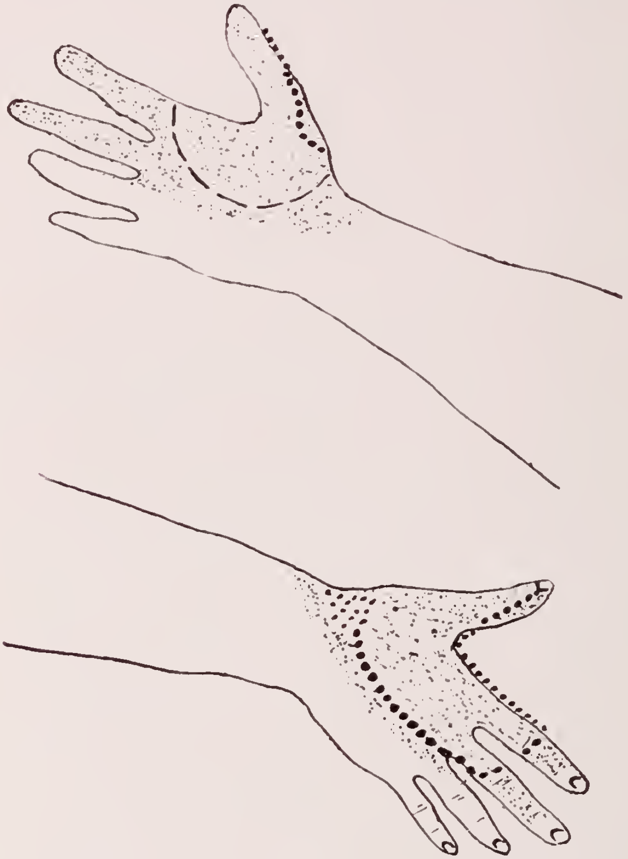


Chart 1. Sensory changes in felon of thumb (Case 8).

12a. J. B. Painful rheumatic shoulder; tenderness on palpation over the origin of the deltoid from the clavicle; periostitis suspected; x-ray; no evidence of periostitis.

(13) Mrs. K. Trifacial neuralgia following metastasis (in the spheno-maxillary fossa) from epithelioma of skin; critical impairment accompanied by intense intermittent pain; section of the 3rd division of the 5th; temporary partial relief.

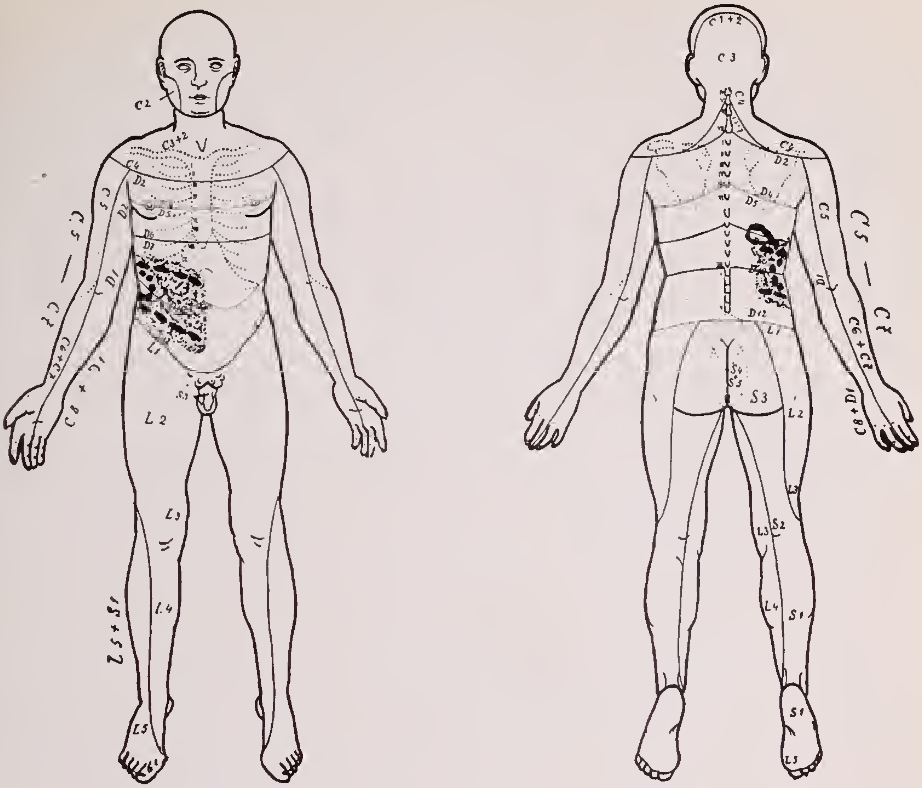


Chart 2. Sensory changes in empyema thoracis (Case 9).

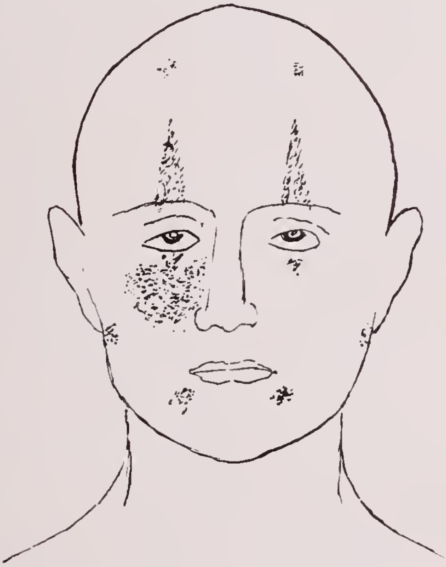


Chart 3. Sensory changes in trifacial neuralgia from infected tooth root.

(14) J. J. S. Trifacial neuralgia; ganglionectomy; partial regeneration with typical sensory phenomena and return of some of the pains.

14a. L. R. Direct tests of the sensibility of the deep tissues; incision down to bone from hip to knee on outer aspect of thigh for osteo-myelitis; skin retracted from deep fascia, etc.; superficial critical sensibility absent in belly of muscle and defective (compared with normal skin) in deep fascia over the muscle, etc.; sensibility absent in muscle but present and effective in fascia for deep critical stimulation (pressure-touch and its localization, blunt compass points two and one-fourth inches apart, simultaneously and consecutively applied with steady pressure and without causing pain); for affective stimuli (including pressure-pain) sensibility was absent in the muscle but present with a tendency to over-reaction spreading, etc., in the fasciae overlying it; specific sensation for gross and intermediate degrees of heat and cold was also preserved in fascia, etc., but impaired compared with normal skin sensibility. For other tests of deep sensibility see Cases 17b and 24a.

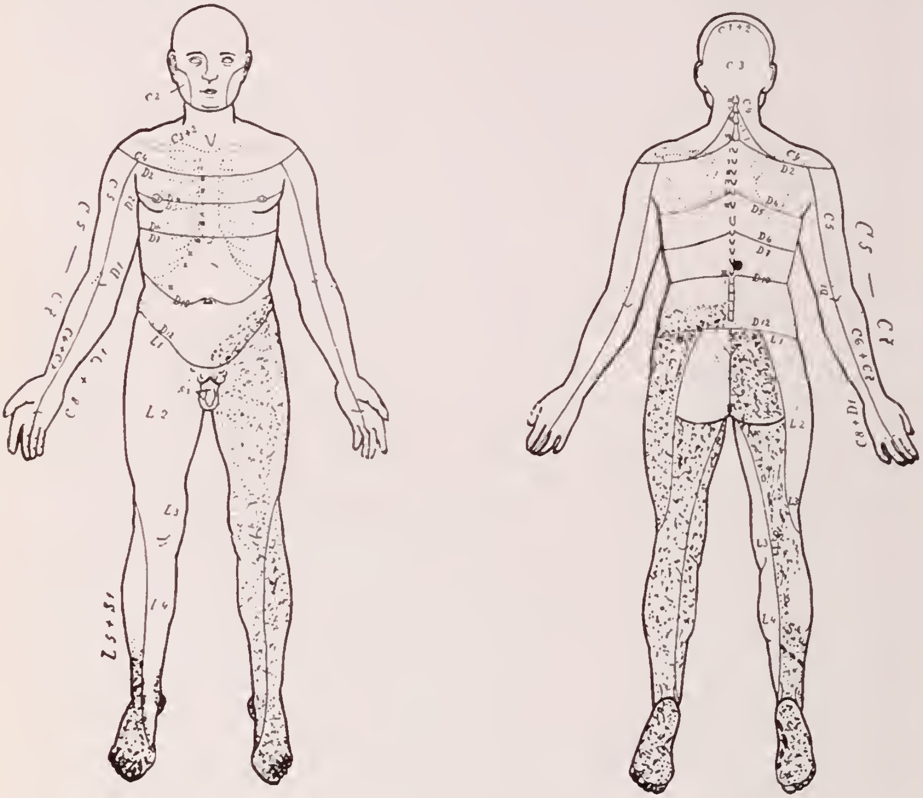


Chart 4. Sensory changes in stab wound of cord and cauda equina (Case 15).

II. Lesions of the Posterior Nerve-Roots.

15. B. B. Stab wound severing posterior roots Li to Sii inclusive, and the right half of the cord causing Brown Sequard's paralysis; lived many months; no pain or tenderness at any time; died of pulmonary tuberculosis; autopsy; findings as above. Chart 4. Severing, on left side, the posterior nerve roots Li to Sii inclusive, and cutting the left half of the cord at the third lumbar segment causing Brown-Sequard's paralysis.

Left leg: shaded area shows loss for all forms of superficial critical and affective stimuli; prolonged massive applications of gross heat and cold were imperfectly felt on the front and inner sides of the thigh; no over-reaction, pain or tenderness.

Right leg: shaded area shows impaired sensibilities for superficial critical stimuli, the loss being absolute for these forms, as well as for pressure-touch above the level of the knee; the interrupted line on the leg and foot bounds an area of lost sensibility for prick and for gross heat and cold; no over-reaction or pain. The large dot on the back to right of the eleventh thoracic spinous process represents the site of entrance of the weapon.

16. R. P. Fracture-dislocation of 12th thoracic vertebra; severe contusion of cord (complete functional transverse lesion) with clean severance of the 11th thoracic posterior root on the left; no pain except on movement or jarring of trunk: only slight hyperalgesia for the dragged pin-point at the level of the lesion; operation; findings as above; died.

17. F. S. Fracture-dislocation of the 2nd lumbar vertebra; injury (stretching) of the cauda equina on the right side; marked sensory impairment for all forms of stimuli chiefly in the areas of distribution of the 3rd, 4th and 5th sacral roots; rapid recovery; no pain or tenderness; studied another case in which findings and results were similar.

17a. C. F. Section of the 6th, 7th, 8th and 9th posterior thoracic roots for gastric crises of tabes; no evidence of regeneration in roots three years after operation; shooting pains all over the body with the exception of the area supplied by the nerves operated on; gastric crises not improved by operation.

17b. W. O. Fracture dislocation of the sacrum; complete severance of the 3rd, 4th and 5th sacral roots on the left with over-stretching and compression of the corresponding roots on the right and of the 2nd sacral roots on both sides; no pain or tenderness seven months after injury; operation to relieve loss of bladder and rectal control; findings as above; severed roots sutured and the others liberated; two weeks after operation tests were made on the deep sensory nerves directly beneath insensitive skin on the left buttock; sensibility present in the structures beneath the skin for pressure-touch and its localization, for pressure-pain, and for gross heat (70° C.) and cold (ice) in massive prolonged applications; a needle driven through the skin caused pain which was fairly well localized the moment the point reached the deep fascia; very hot and cold isotonic solutions injected beneath the insensitive skin caused pain and discomfort; at times and in certain places the specific sensation for heat was correctly appreciated, cold not being appreciated at all. See Cases 14a and 24a.

Tests similar to the foregoing made in normal individuals (J. B. and Dr. H.) showed that the needle point after passing through the skin caused sharp pain on reaching the deep fascia or the periosteum, but not on entering or passing through the muscle substance; very hot (60°-70° C.) salt solution injected into the muscle caused a peculiar testicular-like pain which radiated very much; no specific element; in the fascia and under the skin pain was felt with little or no specific element; moderate degrees of heat (50° C.) were felt as warm in the fascia and under the skin but not in the muscle. Strange to say cold (5° to 10° C.) caused neither pain nor sensation of cold in either muscle or fascia where contact of the needle with the skin receptors was eliminated.

17c. In several cases of practically cured herpes zoster critical sensibility was profoundly impaired, over-reaction being present for affective stimuli when felt. In one case, which commenced as a trifacial neuralgia, herpes developed in the area of distribution of the upper division of the nerve (herpes zoster ophthalmicus). Evidently the neuralgia from the outset was caused by an inflammation of the gasserian ganglion. There was some evidence of regeneration with little or no pain or tenderness.

III. Gradual Abolition of Function from Lesions Originating (a) Outside and (b) Inside the Spinal Cord.

18. M. S. Had been operated on for extra-dural malignant neoplasm; recurrence; paraplegia in flexion, gradual abolition of sensibility to the level of the 10th thoracic segment; critical elements, first, and gross affective, last to disappear; as the critical elements disappeared the affective elements took on "protopathic" characteristics, *i. e.*, over-action, radiation, inability to appreciate the nature of the stimulus. Chart 5.

Light touch: sensibility for cotton wool lost up to the line of heavy dots in Fig. A; the lightly stippled area represents the loss for the finer von Frey hairs.

Presssure touch: the interrupted line in Fig. A shows the level of loss for the unweighted aesthesiometer whilst the line of dashes and circles shows the loss for the aesthesiometer weighted with 40 grams. Hair sensibility absent, for stroking and pulling, on the legs and feet, but even light stroking of the hair on the legs or on dorsum of either foot elicits the flexor-flexion reflex though the patient experiences no sensation. Localization and compasses (points simultaneously and consecutively applied) showed marked impairment.

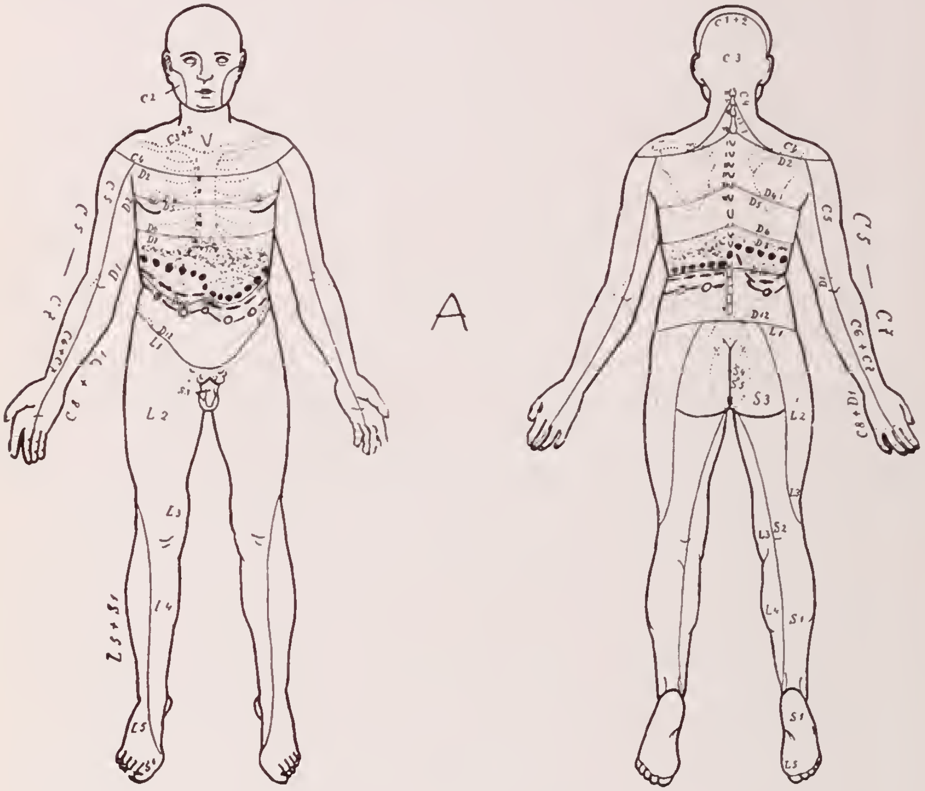


Chart 5 (A). Sensory changes in cord compression from extra-medullary neoplasm (Case 18).

Pain: the heavily dotted line in Fig. B shows the level of loss for prick with the algesimeter at 2 grams pressure. The interrupted line represents the level of loss at 12 grams pressure. On the dorsum of the right foot and on many areas on the right leg, prick at 2 and 6 grams pressure, caused a very disagreeable feeling. This was accompanied by spreading and reference to parts above and below, the flexor-flexion reflex being simultaneously elicited. The left foot (dorsum) showed similar phenomena, but to a much less degree. The patient had no conception of the nature of the stimulus nor of the localization of its point of application.

Pressure-pain: pinching the skin of both legs caused pain that was poorly localized and attended by wide radiation. It also elicited the flexor-flexion reflex. With the algometer, a pressure of 8 kilos over the right buttock elicited reflex movement; 11 kilos elicited a disagreeable feeling with radiation, etc. Over the left buttock a pressure of 5.5 kilos elicited reflex movement and discomfort (pain).

Temperature: for 38° C. sensibility was lost up to the level indicated by the heavily dotted line in Fig. C. Heat at 55° C. (large pitcher of hot water) caused an uncomfortable sensation described as "sticking" upon the thighs, legs and feet. This was attended by over-reaction, radiation, etc. In Ag. tube (55° C.) elicited the flexor-flexion reflex when applied to various areas on the lower trunk and thighs. The specific sensation of heat was lost for 55° C. up to one inch below the level of loss for 38° C. For 23° to 25° C. sensibility was lost up to the line of dashes in Fig. C. The specific sensation of cold was lost for ice up to one inch below the level of loss for 23° C. Ice in a large pitcher caused an intensely disagreeable feeling over the legs and especially over the soles. This elicited the flexor-flexion reflex and was accompanied by over-reaction and wide radiation. Both the nature of the stimulus and the point of its application were unknown.

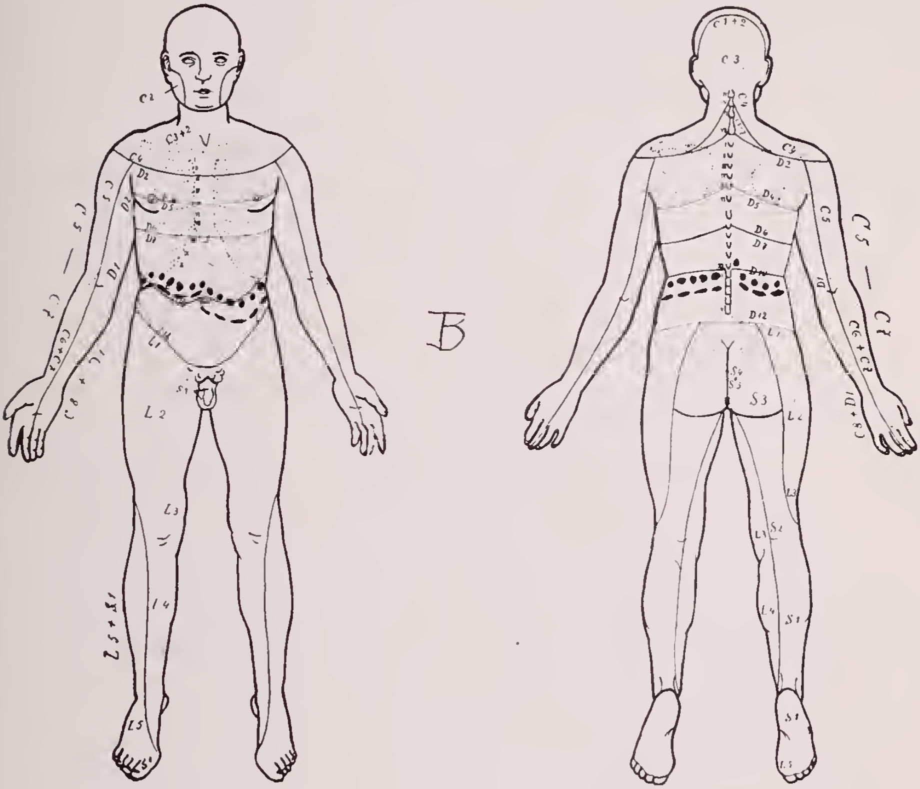


Chart 5 (B).

Posture and Passive Movement: both markedly impaired in toes, ankles, knees and hips. Tuning fork tests showed a trace of preserved sensibility over the dorsum of the right foot with absence of sensibility over the left foot and over both legs.

18a. Mrs. C. Extra-dural malignant neoplasm surrounding the cord in ring fashion (7th to 10th thoracic segments) within the vertebral canal; paraplegia in flexion; sensory phenomena like preceding case; operation (author present); findings as above; cord pressure relieved; case studied from day to day for the return of sensibility; vibration (tuning-fork) first to return six days after the operation; this was quickly followed by the grossly affective forms; sudden appearance of shooting pains all over the previously insensible areas; these disappeared with the reappearance of critical sensibility, the deep critical elements returning before the superficial; unfortunately succumbed to decubitus infection before return of sensibility was complete.

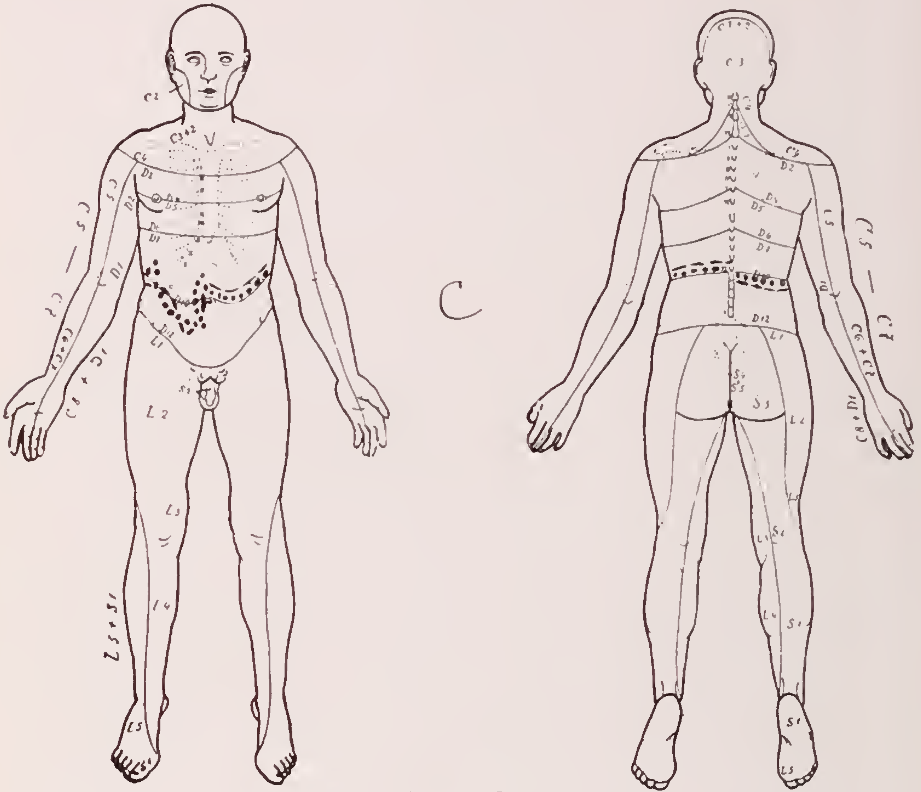


Chart 5 (C).

18b. K. C. Extra-medullary cancer secondary to cancer of breast; complete transverse lesion with "isolation dystrophy"; all reflexes abolished; sensibility for all forms lost; represents end result of progressive cord compression.

19. B. H. Syringo-myelia with complete abolition of function in the paths mediating the affective elements (pain, discomfort, etc.) the paths for the critical elements (touch, sharpness, localization, specific sensation of heat, cold, etc.) being but slightly affected; specific sensation for cold absent on left thorax that for heat being preserved. Chart 6. The shaded areas in Figs. A and B represent loss of sensibility for the purely affective "hurt" elements of such stimuli as prick, pinching, gross heat and cold. In Fig. C the dotted line marks the limit of pain-loss for prick (at 2

grams pressure), etc., the interrupted line showing the loss for prick at 12 grams pressure as found a few moments after mapping out the area bounded by the dotted line. The boundary of loss for the pain elements had shifted, even across the middle line. In Fig. D the heavily dotted lines mark the limits of loss for the "hurt" elements in prick, gross heat and cold, etc. The shading in dots on left thorax marks the loss for pressure-touch (threshold obtained with aesthesiometer weighted with 5 grams): the linear shading represents the absolute loss of specific sensation force, and impaired specific sensation for heat (threshold obtained at 45° C).

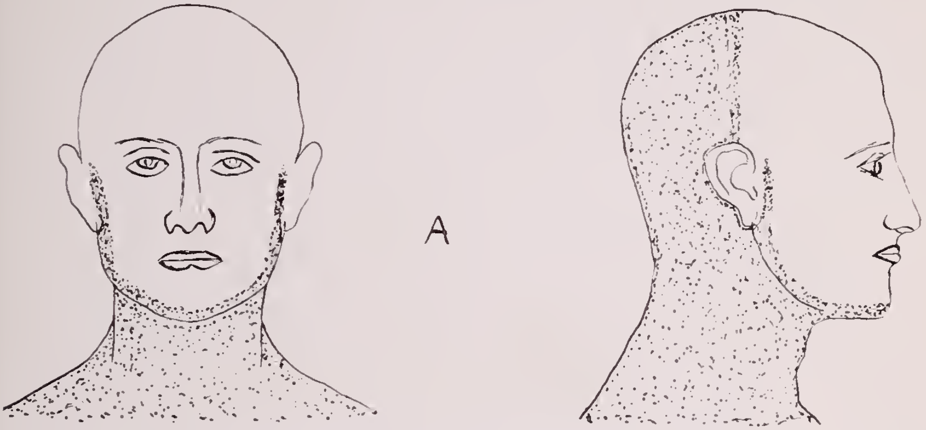


Chart 6. Showing sensory changes in syringo-myelia (Case 19).

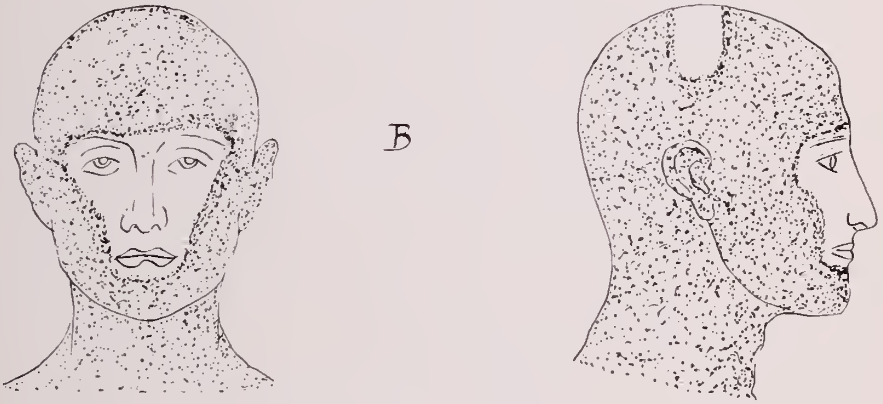


Chart 6 (B).

IV. Lesions Above or in the Vicinity of the Sensory Decussation in the Medulla Oblongata.

20. E. R. Tumor of cerebellum compressing pons, medulla, and 5th cranial nerve root on the right; critical sensibility markedly impaired over whole area of distribution of the 5th nerve on right and to a less degree over whole left side of body from head to foot; for affective stimuli threshold slightly raised; sensation when evoked being attended by over-reaction radiation, etc., moreso on right (face); operation, death;

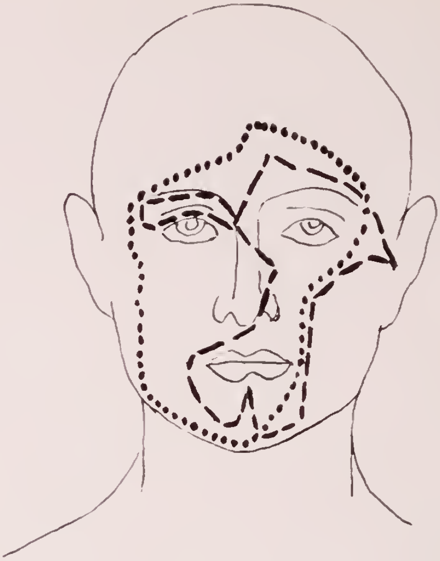


Chart 6 (C).

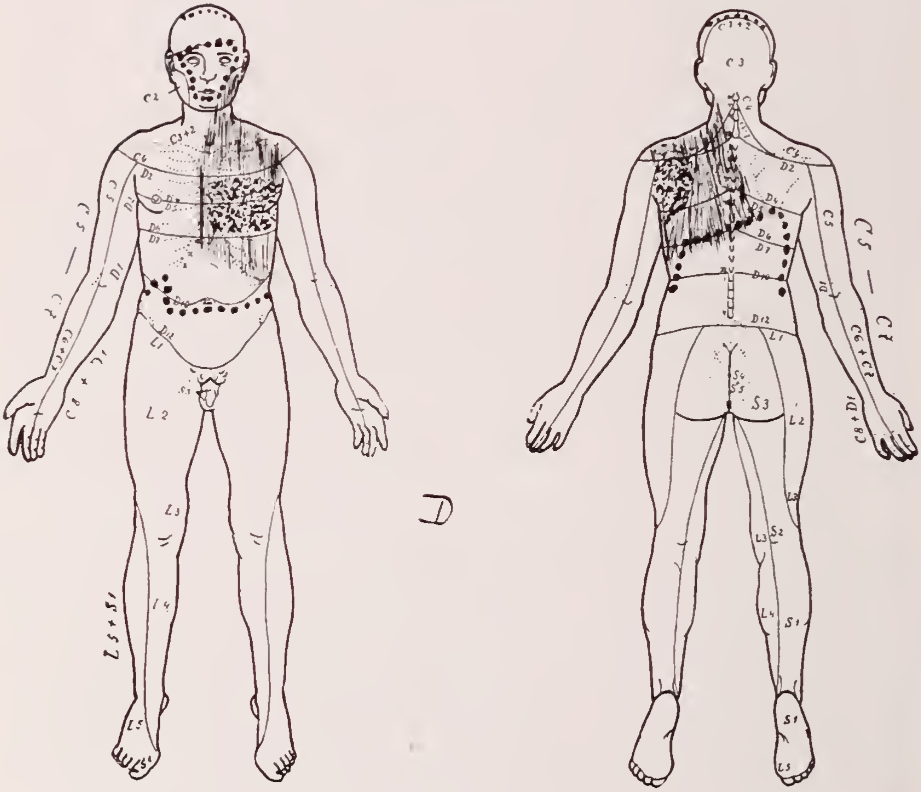


Chart 6 (D).

autopsy; findings as set forth above. Chart 7. The shaded area represents lost or markedly impaired sensibility for critical stimuli (alternating anesthesia) and over-reaction with radiation, etc., for affective stimuli when felt.

Photographs of brain (A and B). The tumor is seen compressing the root of the fifth nerve and the ponto-medullary region of the right side. The extent of the compression is appreciated by noting the position of the basilar artery which marks the middle line.

The fifth nerve root, marked V, shows well on the left; on the right it may be seen as a flattened band appearing in cross section in the dark space just cephalad of the tip of the tumor. The right cerebellar hemisphere has been removed in part. In photograph B (from a drawing after removal of the tumor mass) the extent of the compression of the ponto-medullary region and of the fifth nerve on the right side is well shown.

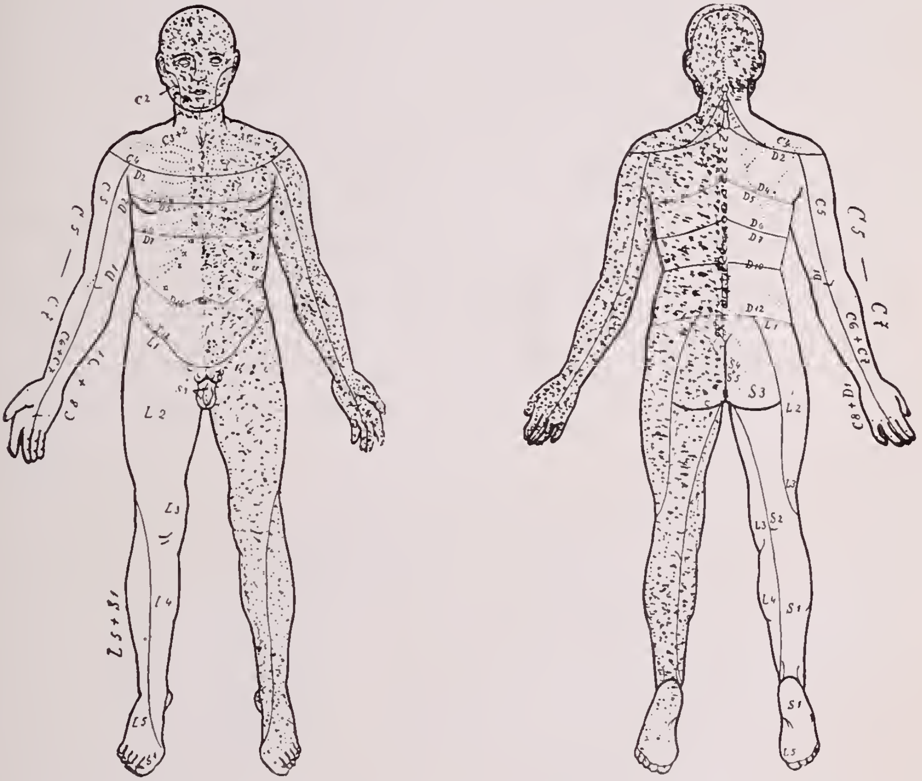
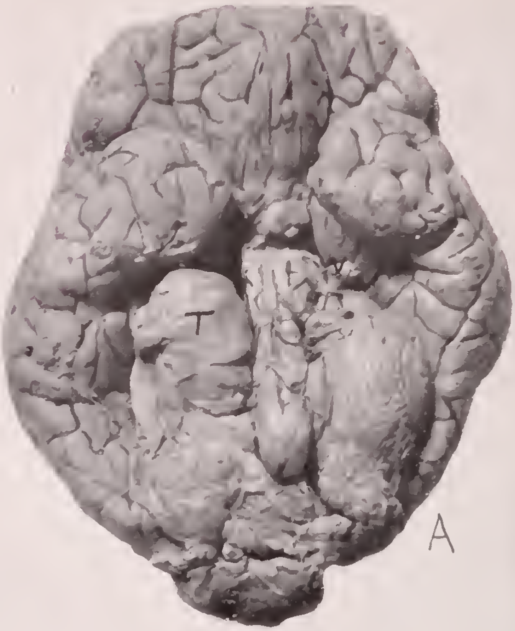


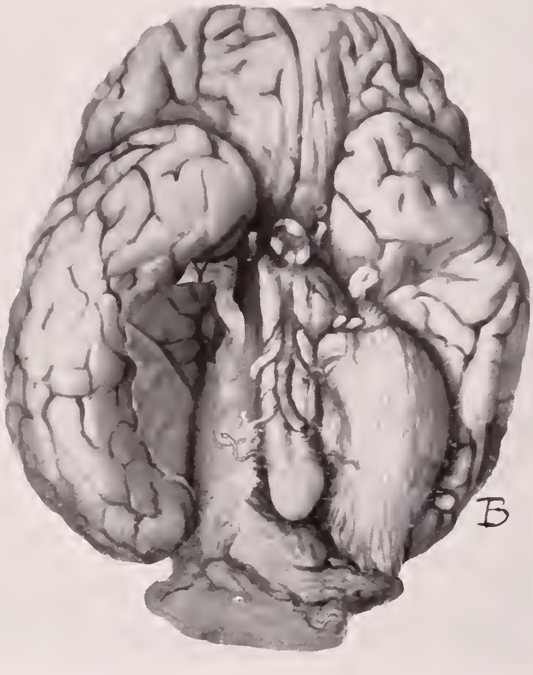
Chart 7. Showing alternating anesthesia in tumor compressing the ponto-medullary region on the right (Case 20).

V. Lesions of the Optic Thalamus.

21. H. McC. Lesion causing hemiplegia and typical thalamic sensory phenomena; on trunk, limbs, scalp and outer aspect of the face and neck of right side, complete loss for all critical forms and for all superficial affective stimuli (prick in single stimuli, extremes of heat and cold in test tubes); deep affective sensibility preserved for the hurt elements in pressure-pain, repeated prick applied with much force, massive prolonged applications of gross heat and cold—all these when felt being attended by over-



Case 20.



Case 20.

reaction, radiation, reference and ability to appreciate the nature of the stimulus. Over the mesial third of the face and neck sensibility was absent for the superficial critical forms (light touch, compass points simultaneously but lightly applied, degrees of heat and cold about the neutral point, viz., 25° and 38° C.), but preserved for the deep critical forms (pressure-touch and its localization, compass points consecutively applied); for the superficial affective forms (prick in single stimuli; minor degrees of heat and cold, 45° and 20° C. in test tubes) sensibility preserved but attended by over-reaction, poor localization, radiation, reference and inability to appreciate the nature of the stimulus. Three other thalamic cases, B. M., Mrs. McL. and B. F., identical with this in distribution of sensory changes, were studied. Chart 8. Showing area in which superficial critical was dissociated from deep critical sensibility. For superficial critical stimuli (lighter von Frey hairs, compass points simultaneously applied, heat at 38° to 40° C. and cold at 23° to 24° C.) sensibility was absent to the middle line. For deep critical stimuli (pressure-touch and its localization, compass points consecutively applied), sensibility was preserved over the mesial third of the face and neck. The dotted line represents the boundary of preserved sensibility for pressure-touch, the aesthesiometer being weighted with 40 grams. Passing mesially from this line the threshold rapidly became lower. For superficial affective stimuli (prick, heat at 55° C. and ice in Ag. tubes) sensibility was preserved over the mesial third of the face and neck. The line of dots and dashes represents the boundary of preserved sensibility for prick with the algesimeter at 2 grams pressure and (approximately) for gross heat and cold. These stimuli when felt were attended by over-reaction, radiation, reference and inability to appreciate the nature of the stimulus. For deep affective stimuli (pressure-pain) sensibility seemed normal with no evidence of over-reaction, spreading, etc. Over the remainder of the right side of the body sensibility was lost for all forms of superficial and deep critical stimuli and for superficial affective stimuli but preserved, with slightly raised threshold, for deep affective stimuli, these latter when

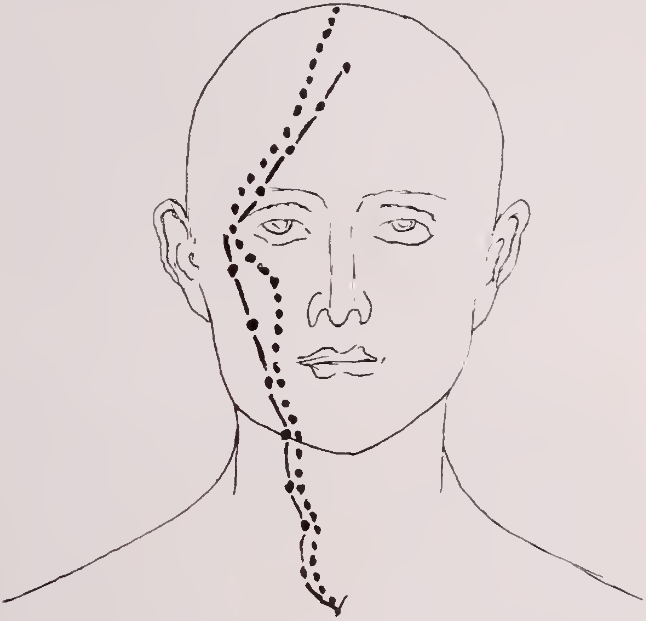


Chart 8. Sensory changes in thalamic lesion (Case 21).

felt being attended by over-reaction, radiation, reference and inability to appreciate the nature of the stimulus.

VI. Lesions Above the Optic Thalamus.

22. W. G. Fracture of skull in vicinity of right post-rolandic area; scalp incised; fracture found; recovery; erysipelas of scalp; hemi-paraesthesiae ("pins and needles," "burning," "electricity," etc.) on left side of body from head to foot; after many months general improvement of paraesthesiae in face and hand; sensibility for critical forms (touch, posture and passive movement, specific sensation for sharp-

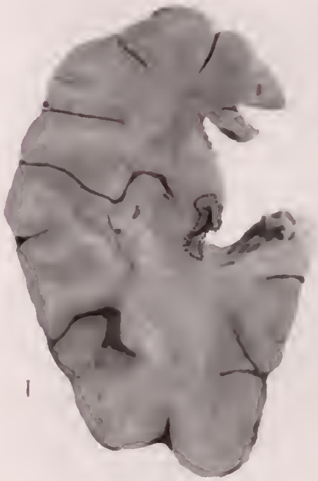


Fig. 1.

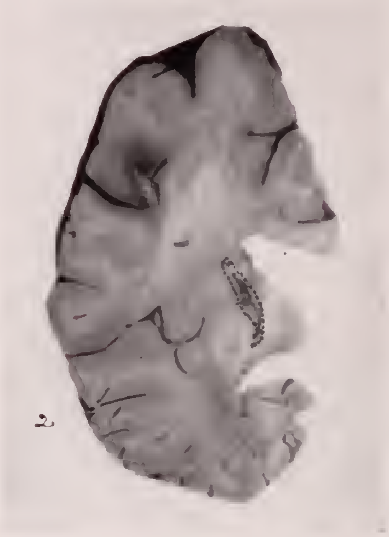


Fig. 2.

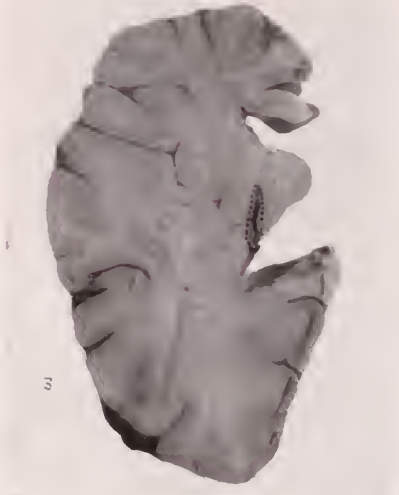


Fig. 3.

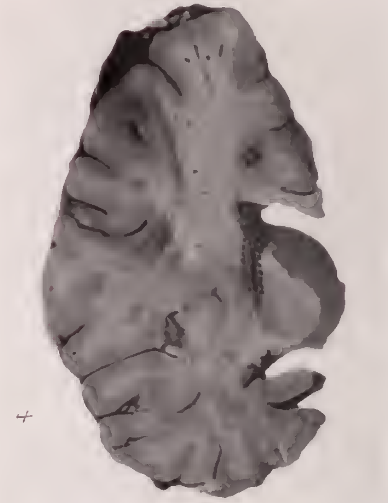


Fig. 4.

ness, heat, cold, etc.) markedly impaired in hand and foot; marked variability of threshold; inability to establish threshold on affected side; sensibility preserved for purely affective, "hurt" elements; localization impaired; affective stimuli attended by radiation; no over-reaction except in the case of gross cold (which was felt as

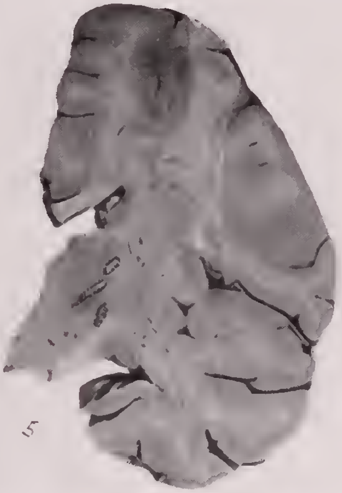


Fig. 5.

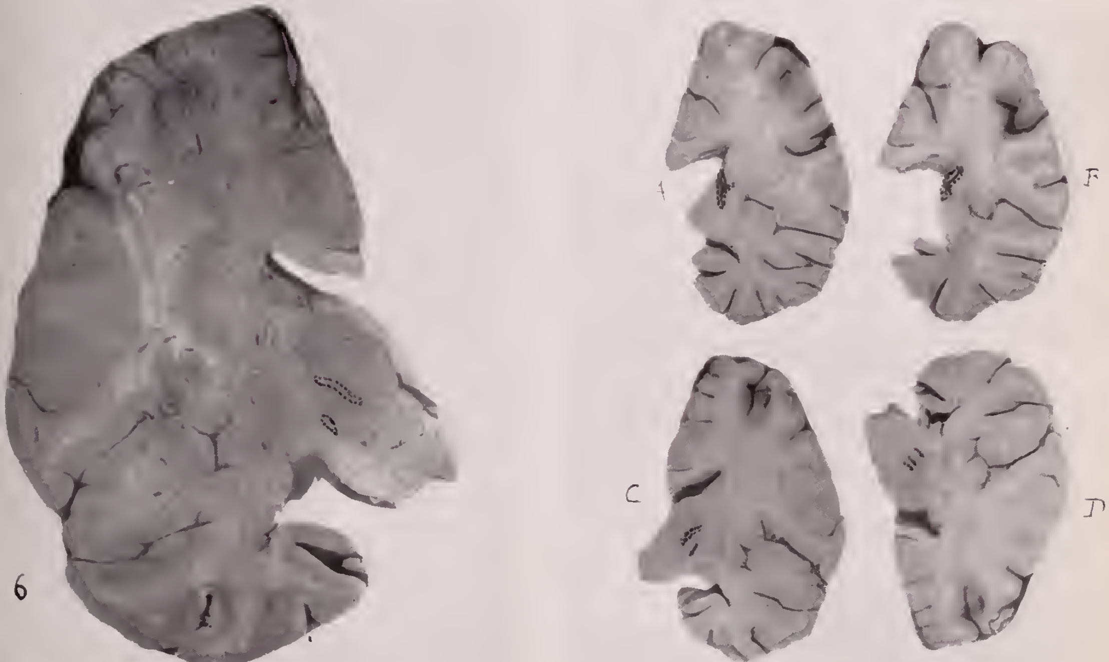


Fig. 6.

"burning") applied to the trunk; in subsequent tests no undue over-reaction to cold on trunk.

23. J. C. Small area of necrosis in the posterior dorso-lateral region of the thalamus and in the internal capsule (partly in the motor and partly in the sensory portion); unilateral rightsided convulsions at onset and on several occasions within the month following onset; convulsions always began in the right hand with local sensory aura; athetoid movements of right hand especially when tired or mentally perturbed; no convulsions for three months; sensibility impaired for critical forms (touch, sharpness, consistency, size, shape, form, texture, etc.); variability of threshold; sensibility preserved for affective forms without over-reaction, etc.; operation; autopsy. (Case 23.) The photographs of the brain in this case show a vascular lesion of the dorso-lateral region of the posterior portion of the thalamus and of the internal capsule. This was the only lesion found to account for the right sided unilateral convulsions commencing in the hand and spreading to the face and legs; the right homonymous hemianopsia that occurred during the convulsions; the athetoid movements; the impaired critical sensibility with variability of threshold. Affective sensibilty was preserved without appreciable over-reaction, etc. The focus of the lesion measured 3 cm. from before backwards by 3 cm. vertically, by 3 mm. from side to side extending from a point in the white matter bounding the ventricle, caudad and laterad of the thalamus, forward into the internal capsule and dorso-lateral region of the posterior portion of the thalamus. The left half of the brain was cut into coronal sections of one cm. in thickness. The photographs of these sections numbered from behind forward, show:

Fig. 1, 7th section, anterior view.

Fig. 2, 8th section, posterior.

Fig. 3, 8th section, anterior.

Fig. 4, 9th section, posterior.

Fig. 5, 9th section, anterior; the ragged areas of necrosis are plainly visible in the lateral aspect of the thalamus (dorsal half) and in the internal capsule; the darker dorsal half of the thalamus represents an area of grayish discoloration, possibly thrombotic softening. A magnifying glass shows the thalamo-cortical fibres interrupted by the lesion as they leave the thalamus.

Fig. 6, 10th section, posterior; lesion disappearing.

A, 8th section, anterior.

B, 7th section, anterior.

C, 9th section, anterior.

D, 10th section, posterior.

The posterior portion of the thalamus appeared on the posterior aspect of the 7th section from behind forward, the anterior portion disappearing at the level of the interior of the 13th section. The lesion appeared at the posterior aspect of the 7th section and disappeared in the 10th section. Hence the site of the lesion involved chiefly the posterior portion of the internal capsule and thalamus (dorso-lateral region).

24. S. G. Meningo-encephalitis of rolandic area; sensory seizures (consisting of pain, "electricity," "pins and needles," etc.) followed by local spasms and sometimes by general convulsions; critical sensibility impaired; variability of threshold; sensiblity preserved for affective stimuli; no over-reaction; sub-temporal decompression 18 months ago; a few general convulsions just after operation, none since; sensory condition markedly improved but some slight abnormalities persist.

24a. Mrs. McL. Hemiplegia; thalamic phenomena and sensory findings identical with those found in Case 21; sub-temporal decompression; no anodyne or anaesthesia save 1 per cent. novocaine injected into superficial portion of scalp; muscles not sensitive to scalpel though their coverings and the periosteum were; cranial bones insensitve; dura mater very sensitive; cerebral cortex and white matter insensitive to exploring needle; cortex insensitive to heat at 40° C.

THE INTERRELATION OF THE COMMUNITY AND THE STATE INSANE HOSPITAL.*

By

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THE purpose of this paper is to attempt to systematize and correlate certain general ideas held presumably by many of my audience, to make some few suggestions as to how our usefulness to the insane patient, and thereby to the community, may be increased, and finally to point out in what respects the community may better perform its duty to the state insane hospital. The strictly medical phases of the treatment of the insane will be subordinated to what we may term the sociologic and economic aspects. It may well be that some of the suggestions will be considered Utopian and impracticable; nevertheless, it is hoped that the practical points will outweigh the ideal. It is an unfortunate fact that especially those of us who are engaged in institutional work are, by our very proximity to the work, blinded to its broader aspects. Perhaps, therefore, an essay like the present, which partakes to a certain extent of the ideal and abstract, may be of some service in pointing out the mutual relations and responsibilities of the community and the state insane hospital.

Insane asylums (as they were then termed) were originally founded for the purpose of protecting society against the violently insane; even today this function is an important one. In addition, however, to preventing those insane with homicidal or other criminal tendencies from doing damage, the state insane hospital of today shields the community from some of the mentally incompetent who, though not criminal, are parasites on society. Some of these are tramps, some prostitutes; all are, in the economic sense, minus quantities. They are not producers; they cannot even "drift," but are dependent at least in part on individual or social charity. From these, too, then, the state hospital protects society, to the extent, at least, to which these persons become inmates. Thus, in spite of the rather obvious fact that here the institution tends to promote the survival of the unfit, it at least concentrates these individuals, thus decreasing the total cost of their support. Economically, then, we may urge this as our *raison d'être.*

So much, for the present, for the social aspect. Of late years the welfare and protection of the patient have received somewhat more attention. First of all, we protect the patient with suicidal proclivities from himself. In this, of course, we are justified quite aside from humane considerations, for the depressed patient, on recovery, frequently takes up once more a useful place in society. The number of suicidal patients, however, is small compared with the number we protect not so much from themselves as from society. The number of neurotic individuals is large, and the conditions of modern life put a heavy strain on such persons. They crave excitement, and so help further to increase the tension of living. This vicious cycle probably accounts for a certain proportion of the admissions to state hospitals. Whatever be the reason, certain it is that a large number of the individuals received by institutions for the care of the insane are persons who, after leading useful lives, have broken down mentally to such an extent that they are unable to continue the battle. It is to this class of unfortunates that we shall devote the most of our attention in this paper.

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*Read before the Alethean Club, Boston, Mass., November 9th, 1917.

Having considered briefly the two-fold function of the state hospital, let us now ask ourselves what the community may reasonably expect, and in what ways the hospital can best fulfill these expectations.

The protection of the community from the dangerous insane person is, of course, an obvious necessity. It was long ago recognized that the insane should not be judged by the same standards as the sane, and it is for this reason that there were established distinct institutions for the care of those insane deleterious to the public welfare. It is, of course, to be expected that these persons, though restrained, should be treated as humanely as possible. Little more, perhaps, need be said on this purely custodial phase.

In addition to demanding that it be protected from undesirable insane, the community has a right to expect that as many as possible of the inmates of the insane hospital shall be returned to society, if not to resume their old places of usefulness, at least to do some small share of the world's work. Each individual who, after doing his part in adding to the sum total of the world's wealth, becomes a patient in a state hospital, is more than a producer lost. Not only does his value as a producer cease, but so long as he remains in the institution, he is (in the economic sense) a parasite. He is supported by society, and in return for this support does nothing. Every patient, therefore, who can be returned to the community as, at least, self-supporting, represents, so to speak, a lowering of the premium which society must pay for its insurance against the antisocial activities of its insane members. For insofar as the support of insane hospitals is motivated by a spirit of self-defense on the part of the State, its purpose may certainly be compared to that of the cautious business man who takes out, for instance, burglar insurance.

The fulfillment of this expectation presupposes a thorough study of the patient. One important factor in this study is an acquaintance with his history prior to his entrance into the hospital, an acquaintance best made possible by the investigations of field workers. The value of field work has of recent years been better recognized, but with few exceptions most state hospitals have been hampered in this work by lack of sufficient funds. First of all, a fairly large corps is needed if each case is to be fully studied. The ideal worker will, first of all, be a person of tact and a personality such as will win confidence easily; the human element is of great importance in this line. In addition, she (though men are most decidedly not excluded) should have a knowledge of the various types of mental disease, and an appreciation of significant premonitory symptoms and the subtler changes in character. Finally, she should be able to elicit the important non-medical facts concerning the patient, such as his efficiency in his work, with his natural limitations and excellences. In short, she should make a report to the hospital covering not only the history of the psychosis, but one which will answer in all phases the question "what sort of man was he?" Unfortunately, the persons under our care in state insane hospitals are still largely considered as cases, rather than patients. This depersonalization, so to speak, is found in many of the articles on psychiatric subjects appearing in our journals. There is nothing more intimately personal and distinctive than the individual's mind, that is, the sum total of his mental processes as influenced by temperament, training and environment. Yet some papers would almost give the impression that cases of a given mental disease are as much alike as, for instance, cases of measles. Nor can it be objected that the scientific attitude is to leave the individual out of consideration. In no realm of study is the human interest less incompatible with the truly scientific than in that of insanity. Hence a full report is of scientific as well as personal interest.

After an adequate field report is at hand, study by the physician is necessary. He, too, must individualize; in addition to making a routine mental examination, he should really become acquainted with the patient, correlating so far as possible the latter's symptoms with his peculiarities, his mode of thinking and his environment before his admission to the hospital. Needless to say, this more detailed work means the expenditure of more time than is the rule, and, thereby the enlargement of the staff. It also calls for the right attitude on the part of the physician. It is dangerously easy to slip into the institutional rut, to become pessimistic and to lose interest in the patient from seeing him day after day. This is especially true, of course, where one has a large number under his charge. If more intensive work could and would be done by the physicians, fewer patients would descend into the limbo of the forgotten whence there is seldom return, and more would be sent back to their families as "floaters," if not, indeed, producers.

Again, it is fair that the community shall expect as much as possible to be done in the line of treatment. With the exception of the psychopathic wards of our institutions most state hospitals are to a certain extent still asylums. This seems unfortunate, yet it is almost unavoidable. With the exception of the syphilitic psychoses (and even here one may be a doubter), we are largely ignorant of efficient means of treating mental diseases. Such forms of insanity as do not tend to chronicity (and alas! most of them do), are likely to recur; in short, the prognosis is decidedly poor. Under such conditions, is it strange that a spirit of pessimism should prevail? Nevertheless, so far as we can, we should employ all the proved methods of treatment insofar as our equipment and personnel will allow, and seek constantly for better and more efficient means. The value of work as a therapeutic measure should not be overlooked. The work assigned should be suited to the patient, and in its choice, his previous training and his probable future environment (should he ever be fit to leave the hospital) should be considered. Training in some special line of work is of value in his readjustment, provided his limitations are recognized. Another element of the hospital surroundings which can do much to aid or hinder the patient is the attitude of the attendants and nurses. The physician can do much toward inculcating in the latter a spirit of tact and sympathy which is of great comfort and support to the patient. The nurse is sorely tried on many occasions, and her duties require great patience. In addition to these qualities, initiative, an ability to perceive the patient's wants and aptitudes, is valuable. That all these qualities are seldom combined is, of course, true, and the wages paid in our institutions are likely not to appeal to those who possess them. Nevertheless, the apparent inaccessibility of an ideal goal should not prevent our striving to reach it.

Finally, the community may reasonably expect that the relatives and friends of patients shall be courteously treated by the staff, and that their suggestions shall be listened to and followed so far as is compatible with the patient's welfare and the discipline of the hospital. Much can be done toward promoting the *entente cordiale* by making the visitors feel that we have a personal interest in our patients. If we try to put ourselves in their place, we shall perhaps adopt a more sympathetic attitude. Complaints should be investigated, and if a suggestion made is undesirable, a few tactful words will frequently soften the disappointment of a refusal.

Such, then, in brief, are our duties to the community as they are and as they might be. What, in turn, may the state hospital justly expect from society?

First of all, the general attitude of the public as regards the state insane hospital is one which in some respects hampers the fullest usefulness of the latter. Until comparatively recent times, the insane asylum was the byword for horror. If we read accounts of these institutions as then conducted, we may readily understand why a feeling of at least distrust and shrinking existed. The care of the insane has been revolutionized, yet the old tradition is overcome only with difficulty. The custom of the "yellow journals" (examples of which are not far to seek) of exploiting the fortunately rare, though nevertheless unavoidable, accidents which occur in our institutions is a potent factor in keeping aglow the smouldering embers of distrust. The sentiment thus stirred up provokes our legislatures into passing laws concerning the care of the insane which frequently increase expense while decreasing efficiency. It must be confessed, however, that, inexcusable as the conduct of the sensational press is, there is some slight justification for the public's looking on state institutions more as asylums than hospitals. As has been suggested already, this custodial aspect predominates partly because of lack of sufficient funds for more constructive work, and therefore this feeling on the part of the community might be considerably improved by more generous treatment from our legislatures.

Again, the community dreads the state hospital because the presence of insanity in a family is generally considered a stigma, a disgrace, especially if the afflicted person has to be committed. A large part of this feeling is probably unconsciously a relic of the belief that insanity was the possession of a person by a deity or a devil (usually the latter). Biologically, too, there is some reason in an insane person's family fearing that the defective germ-plasm which has produced one psychotic may sooner or later show itself in them in a similar way. The idea that insanity is a disgrace is most unfortunate, however, and when this affliction is generally recognized to be a disease, as is, for instance, pneumonia or diphtheria, the feeling of the community toward the state hospital will be considerably more cordial.

A natural corollary to the proper conception of mental disease by the public will be that the man or woman discharged from the state hospital will be regarded merely as a person recovered wholly or in part from a non-communicable disease, not as one to be shunned and looked upon with suspicion. At present there are probably numerous patients who stay on and on in state hospitals because they know that the prevailing attitude toward ex-patients is one which will make it difficult for them to occupy a useful place in society. Were public opinion more lenient, they could once more resume a position in which they could be happy and of service. As it is, they remain as charges upon the State.

If, then, the public could be taught a rational concept of mental disease, the problem would largely be solved. The *exposés* in the dailies would not find so ready an audience; families would be willing to send their mentally ill to hosptitals for treatment before commitment was necessitated by some overt act of violence; legislatures would be influenced to be more generous, thus enabling the hospitals to study cases more carefully and employ more skilled nurses; and finally, a larger number of patients could be discharged as useful citizens. A pretentious program, is it not? And yet, possibly, not wholly incapable of achievement.

The earlier recognition of mental disease by physicians, district nurses, and others who come into close contact with individuals in a medical way would facilitate the task of the hospital. In general, in this as in all other classes of disease, the earlier treatment is begun, the better the chances of success. This particular phase of the problem, fortunately, is one which is already being met, with very satisfactory results.

In this paper we have now briefly considered some of the mutual relations of the community and the state insane hospital. We have seen that the hospital has certain responsibilities; that in certain of these it is perhaps lacking, but that this failure is due in large measure to the hampering effect of public sentiment and legislative "economy." The remedy has been suggested in considering what the community owes to the hospital: that a correction of the misconceptions now widely held would make the problem of the hospital much simpler, by sending us our patients earlier, allowing us to treat them more carefully, and providing more opportunities for the discharged patient to demonstrate his capabilities.

Co-operation and mutual confidence, then, are the keynotes if the state insane hospital is to achieve its greatest efficiency and discharge fully its duties to the community.

A BRIEF SURVEY OF TWO THOUSAND FIVE HUNDRED PRISONERS.

By

PAUL E. BOWERS, M. D., Michigan City, Ind.

WITHIN the last decade there have been made comprehensive study and careful investigation of crime and the criminal. Many of these studies have been exhaustive and intensive, and carried out upon lines more or less scientific and analytical. We may say with all due respect and consideration to the definition of the word science that criminalistics is rapidly taking the place that it deserves in the wide field of sociological sciences. Just at this point it would be well to acknowledge that the foundations upon which modern investigators are building the penalogical and criminological sciences were laid by the illustrious Caesar Lombroso. Of course, it is understood that we cannot agree with all his conclusions and deductions concerning the criminal or the forces which create him; but we are compelled by the spirit of fairmindedness to admit that he has blazed the trails and pointed the way into the field of criminal phenomena where the physician, the alienist, the psychologist, the jurist and the sociologist are pursuing their favorite themes, sometimes with a spirit of intense narrowness that hinders the progress, but, nevertheless, the results are being articulated, bit by bit, into a broad, well defined system of knowledge.

Just as rapidly as our penal institutions are removed from the control of petty politics, just so soon will greater progress be made along these lines. The welfare of society, the proper administration of prisons in all forms of their care of prisoners, demand that men of liberal training and scientific accomplishments shall be in charge. In accord with the spirit of investigation there were established several years ago at the Indiana State Prison and the Indiana State Reformatory, psychopathological laboratories for research in criminology. Since that time other institutions have inaugurated similar psychopathic clinics, among them the prisons of Massachusetts, Minnesota and very recently Sing Sing Prison in New York.

The purpose of this paper is to give a review of the work attempted at the psychopathic laboratory at the Indiana State Prison, where mental examinations, both psychiatric and psychological have been conducted for the past seven years.

The drawing accompanying this article gives a diagrammatic outline of the manner of classification and disposition of the prisoners received at the Indiana State Prison. Every individual received at this institution is given a complete biographical, physical and mental examination in the psychopathic laboratory of the prison hospital. The greatest care is taken in determining the physical status of the prisoner, making a detailed and comprehensive physical survey, employing all modern methods of searching physical diagnosis. Likewise a neurological examination is made. Following this, the individual is subjected to mental tests, psychiatric and psychologic, as employed in modern hospitals for the insane. The Binet-Simon scale of intelligence tests is also used where there is indication for its employment. A careful biographical statement is taken from the prisoner himself, and, of course, it goes without saying that these histories are not always correct; and much data that is given has to be taken *cum grano salis.* The prisoner's statements are supplemented, proven or disproven and qualified by information that is obtained from the officers of the court where the prisoners were sentenced. The state parole officers also contribute their share of information concerning the prisoners. Of course, these officers cannot obtain the data that a trained social worker might be able to gather, but on the whole the information received is fairly complete and reliable.

The psychopathological examinations given in the prison psychopathic laboratory at once point out the fact that prison population is a heterogeneous mass of individuals, who demand different varieties of treatment, and not the single remedy of punishment and imprisonment as has so long been given criminals by society through its agents who care for its legal problems. A glance at the diagram will readily show what disposition is made of the prisoners.

Now and then persons are received at the institution suffering with acute infectious diseases. Many cases of acute and chronic gonorrhea, chancroid and syphilis in all stages are received. These convicts are quarantined in the venereal department and there given the active, energetic treatment demanded in their respective cases, and as soon as it is safe to discharge them from this department they are again classified and sent to the divisions into which their mental and physical status may fall.

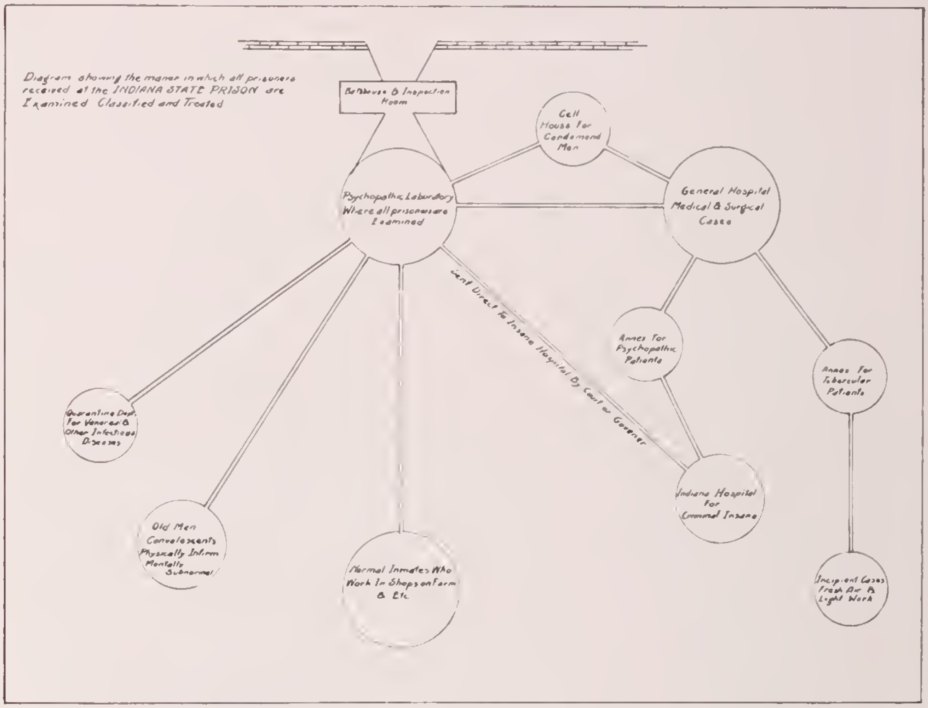


Diagram showing the maner in which all prisoners received at the INDIANA STATE PRISON are Examined Classified and Treated
Bathhouse & Inspection Room
Cell House for Condemend Men
Psychopathic Laboratory Where all prisoners are Examined
General Hospital Medical & Surgical Cases
Sent Direct to Insane Hospital By Court or Govener
Annex for Psychopathic Patients
Annex for Tuberculer Patients
Quarantine Dept. For Venereal & Other Infectious Diseases
Indiana Hospital for Criminal Insane
Old Men Convalescents Physically Infirm Mentally Subnormal
Normal Inmates Who Work In Shops on Farm & Etc.
Incipient Cases Fresh Air & Light Work

In every prison population there are to be found many decrepit, chronically diseased and senile persons who are unable to work at the various industries at the prison or on the prison farm, but who require custodial, convalescent care and treatment. These individuals are recognized at the time of their entrance examinations and are sent directly to this convalescent department in the prison dormitory.

The inmates here have been labelled by the prisoners as "Senators," this name is probably applied because of their garrulity; they are relieved from the strict observance of the letter of the law in prison discipline and a kind but firm supervision is held over them.

The normal and slightly defective prisoners are sent directly to work in the shops, on the prison farm and elsewhere as the disciplinary officer may direct.

The mental status of all these prisoners will be considered later. I find in my examinations in the institutional laboratory that many prisoners are in need of medical and surgical treatment at the time that they arrive at the institution, and these persons are at once placed in the hospital for the repairs needed in their cases. The prison hospital has four divisions, medical, surgical, psychopathic and tubercular. An individual showing mental abnormalities passes directly to the psychopathic ward for observation and treatment. Those suffering from open tuberculosis are at once transferred to the tubercular ward, but those in whom the disease is incipient or latent and who are still able to do light chores and work that would be helpful in their cases, are assigned to the prison yard.

The insane individuals sent by the order of the Governor or the courts are transferred directly, after their initial examination, to the Indiana Hospital for Criminal Insane for observation and treatment.

When persons who have been under observation in the Psychopathic Annex in the prison hospital have shown themselves fit subjects for treatment in the Hospital for Insane Criminals, they are transferred by order of the Governor, after a properly qualified lunacy commission has found them to be insane. The men condemned to die in the electric chair are placed in the death-cell, which is under the hospital roof. These men are inspected by the prison physician twice daily and given such mental examination from time to time as may be found necessary.

There can be no doubt in the minds of those who come in intimate contact with delinquents that there exists a causal relationship between purely physical defects and crime. Of course, we cannot be hasty and dare not hurriedly indulge in unproven generalities or make deductions that bear only a resemblance to truth and accuracy. Again we must not mistake diseases and physical defects which exist purely as incidents or concomitant conditions of crime as causes of delinquency. No doubt the criminologists in times past have in their enthusiasm overrated the purely physical disease factor in the study of criminality. It will never be possible as a general rule to state specifically that this particular crime was a result of this definite physical disease or condition, since three forces are brought to bear upon the individual throughout his entire life, and his offense against the law is the resultant action of a triad of agencies; namely: social conventions, economic conditions and the individual's own physio-psychical organization.

My investigations at the Indiana State Prison have shown that prisoners as a class are more physically defective than are the average citizens. Complete anthropological measurements were made in each instance, but these ar not of particular interest, since their chief purpose was primarily for identification and, in fact, the measurement of the prisoner's physiological functions are far more important than the purely gross anatomical findings.

Physical Condition.

The physical condition of the two thousand five hundred prisoners on admission as shown by complete physical examination was as follows:

Good.	1,435
Fair.	664
Poor.	401

Of course, these terms are more or less arbitrary, yet they indicate in a broad way the groups into which these individuals were divided as regards their status of health. We will now briefly review the chief diseases with which these men were afflicted. Over fifty per cent. of them admitted that they had suffered from gonorrhea and about five per cent. had acute gonorrhea upon admission to the prison. It is probable that many more than one-half had gonorrhea at some time in their lives, even though they did not admit it. About eight per cent. of the men had a chronic gleety discharge or some other sequelae of gonorrhea, such as stricture, gonorrheal rheumatism, and there were three cases of endocarditis, due to the infection of the gonococcus. Nine hundred and thirty-four prisoners admitted having been inoculated with syphilis. A Wassermann reaction was made in some cases, but not all. A Wassermann examination, doubtless, if applied to each prisoner admitted, would reveal a much higher percentage than is shown here; but on the other hand, many individuals suffering with syphilis fail to show a positive Wassermann reaction, and since this number, 934, did admit syphilis we can be sure that the real percentage of venereal infection would be very much higher. Paresis, tabes dorsalis and cerebral lues were not infrequent.

The *bete noire* of prisons is the white plague. There are many problems concerning this question which the penal institutions must solve, but no satisfactory solution can be found until existing legal conditions are remedied. Many cases of tuberculosis develop, no doubt, in prison, yet on the other hand penal institutions are unduly censured concerning the spread of tuberculosis. The prisons are not altogether at fault. For we receive prisoners direct from the courts and jails, in advanced stages of tuberculosis. This fact again bears testimony to the obvious fault of our legal system, which too much considers the crime and not the man. As an illustration of this state of affairs, one prisoner died of pulmonary tuberculosis the day following his admission and he was only kept alive over night by the use of stimulants. Of course, we find here as we do in the civilian population outside of prison, the usual diseases, but these physical ailments I do believe have a higher percentage in prisoners. Their ways of living on the outside, their vices, their dissipations and their environments materially contribute to poor health conditions. Cardiac lesions, nephritis, arteriosclerosis, diabetes, rheumatism, states of malnutrition and many other conditions of physical insolvency, are very common. Almost half of these men exhibited diseased dental conditions, most of them caused by neglect. Dental caries, pyorrhea, dental abscesses and other septic conditions about the mouth lead to a vast train of stomach disorders. Hernias, varicoceles and phimoses were extremely common. Defective hearing and defective eyesight is common; adenoids and enlarged tonsils were numerous. The physical stigmata were present in a very large percentage of cases. There were the various malformations of the skull, such as macrocephaly, microcephaly, arcocephaly, plagiocephaly, dolichocephaly; diastema of the teeth, sharply arched palate, Darwinian ear, Morel ear, deformities of the helix and the lobule, polydactylism, hypertrichiasis, pigmentary retinitis, albinism, syndactylism, hypospadia and hermaphrodism, were frequently observed.

It may be hard many times to show a direct relationship between the just mentioned stigmata and crime, yet they are all to be found with defective states of mind, which hinder the individual in adjusting himself to his environments, and this hindrance of social adjustment frequently gives rise to criminal tendencies. Ocular troubles lead to nervous strain, headaches and states of nervousness. About fifty per cent. of the prisoners show at the time of their entrance examinations some defects of vision. These defects may generally be classified under three heads: congenital defect, such as myopia, astigmatism and hypermetropia; errors of refraction, due to acquired disease or traumatism and various degrees of presbyopia due to an advance in years. The diseased dental conditions impair the digestion and may lead to infectious disorders of the stomach, and the enlarged tonsils and adenoids produce mouth-breathing which prevents proper aeration of the blood. The irritating condition attending phimosis contributes to sexual excitement which leads to masturbation, rape, sodomy and other sexual crimes. The existence of these pathological conditions just enumerated makes it impossible for children to get along properly in school or at work, hence they never reach the high ideals or attain the moral standards which education is likely to bring.

Color.

White	2,043
Colored	457

Out of 2,500 prisoners the colored race represents almost 20 per cent., showing that there is a higher degree of criminality among the negroes than among the whites. The proportion of negroes to whites in the state of Indiana is two and one-fourth per cent., and the proportion of the negro population to that of whites in prison as we have found is 20 per cent. But this is not at all strange when we stop to consider that they represent a more primitive race in whom the atavistic tendencies are much more pronounced. Our civilization has not left its imprint upon the negro's cerebrum to the degree it has impressed the white man's.

Illiteracy, superstition and emotionalism seem to be inherent characteristics of the colored race. The three agencies which we employ for the elevation of the Ethiopian are: religion, education and labor. "As to religion, the negro is a religious animal, more animal than religious, but such religion as he has is emotional religion, closely allied to voodooism." Negro preachers in prison populations are very common, but the religion which they preach has but little relation with personal morality. The educational advantages of the colored race have been very limited. Prior to the great fraternal strife, the Civil War, when slavery was in vogue, the negro was not given an education; he was simply bred and reared, as it were, on the same plan as the stock. Then since the war the strides of education have been very slow below the Mason and Dixon line. Seventy-five per cent. of colored prisoners received at the Indiana State Prison are of southern nativity, and when queried as to their educational accomplishments they frankly lay claim to very little if any at all. Thus ignorance holding the negro in her grasp, it is little wonder that his powers of discernment between right and wrong are limited and stultified, hence the colored race being in excess of the Caucasian in criminality.

Now as to the labor proposition, the negro as a rule performs only menial labor; he is not of a thrifty disposition, rarely accumulates a competency, his earning powers are limited and only a few of the colored people are tradesmen and artisans. The darkey is somewhat of the nature of the ephemeral insects, living from one day to another only. Then when Dame Fortune proves fickle and turns her back on him, when disasters, sickness and disease overtake him, he is easily pauperized and this is the first condition or impetus which leads to criminality.

The negro in the north is particularly subject to tuberculosis, which makes him dependent and criminal. About fifty per cent. of tuberculosis in prisons is among negroes. Likewise venereal diseases are very prevalent among them, and with them, civilization has been synonymous with syphilization and we find among them many cases of locomotor ataxia, brain syphilis and not rarely the dementing type of general paresis. They are not infrequently given to crimes of violence and of the baser emotions, leading to incest, rape and sodomy. But by far the greater number of their crimes is grand larceny. No less than 15 per cent. of them were users of cocaine and morphine, taken by way of the mouth, sniffing it in the nostrils and by means of the hypodermic needle. Imprisonment seems to be no great deterrent from crime among the colored people. The modern prison of the northern states seems to hold no terror for him as long as his physical wants are cared for. He is usually very happy, literally a child of nature.

Men Employed and Idle.

Employed	1,394
Idle	1,106

These figures are very interesting and suggestive. From them we would form the opinion that a little over one-half of these prisoners were employed at the time they committed their crimes, but as a matter of fact they were not so occupied.

It can be said with absolute certainty that no less than seventy-five per cent. of our prison population is composed of persons who are without mechanical or trade skill; who earn their means of livelihood in the crudest form of physical labor to which they apply themselves irregularly and in a half-hearted manner. Their average wage income is to be classed at the lowest wage earning scale.

It has almost become proverbial that thievery, dishonesty and beggary go hand in hand with a lowest wage earning capacity. Those individuals who are without mechanical skill or trade knowledge, or, in other words, devoid of definite training in honorable pursuits, are most likely to resort to thievery as a means of subsistence.

Among these twenty-five hundred men, trained and skilled mechanics were very few and when one was found the institutional officials were indeed glad to find one prisoner out of many hundred who even had a rudimentary knowledge of carpentry, bricklaying, plumbing or other forms of mechanical art.

The great fundamental fact that stands out in the critical survey of these men is that they were untrained in mechanics, unlettered, shiftless, improvident and irresponsible. Many of these prisoners are imbued with the idea that the world owes them a living and they attempt to collect this supposed debt in a manner that requires the least mental or physical effort. Many of them pretend to work at such occupations as following fairs, shows and circuses, peddling shoestrings and pencils, cooking in camps, gathering junk, working as porters and cuspidor cleaners in saloons, working about livery and race-horse stables and as fake solicitors for magazines and other commodities. Even at these occupations they only apply themselves in a desultory and intermittent manner.

The old saying that "an idle brain is the devil's workshop" is literally true, and I would add to it that: Idle hands are the devil's tools. Let us take from the devil his tools. Close the devil's workshop, and you will close the prison doors to the great majority of young men who are daily donning the felon's garb. This is the "closed shop" that will close the principal avenue to crime.

Associates.

Good	310
Mixed	1,250
Bad	940

The associations of these men were as follows: 310 claimed to have fostered good companionship, 1,250 mingled with both good and bad in their business relations and private life, 940 sought the company of criminals, saloon and barrel-house keepers, habitues of houses of ill repute and houses of assignation, and that of frequenters of low-grade dance and billiard halls; in short, with persons generally of evil character. The influence of vicious associations cannot hardly be overestimated as a factor contributing to crime.

Educational Standing.

Illiterate	432
Read and write	680
Fourth grade	785
Eighth Grade	496
High school	92
College	25

It is apparent that there is a relationship between the lack of education and criminality. Crime is much more common among the illiterate than among the educated; in fact, about one-fourth of the population of our prisons today are almost wholly illiterate, while only about one per cent. have a college education, which shows very plainly that but comparatively few college graduates ever become criminals. This simple fact goes far in proving that education reduces crime. Some of these illiterate and ignorant prisoners lacked the opportunity to secure even a rudimentary education, but they represented but a very small per cent. Others, through bad companionship, vicious associations, idleness and truancy deliberately threw away their chances to rise above illiteracy. In many instances the cause of their lack of education was an inability to learn because of mental defectiveness and such physical conditions as poor eyesight, adenoids, enlarged tonsils and defective hearing, all of which had a tendency to create a distaste for study and a condition of incorrigibility.

"The Federal Bureau of Education, from statistics applying to twenty states, has recently formulated these conclusions: (1) that about one-sixth of all the crime in the country is committed by persons wholly illiterate; (2) that about one-third of it is committed by persons practically illiterate; (3) that the proportion of criminals among the illiterate is about ten times as great as among those who have been instructed in the elements of a common-school education or beyond."

Victor Hugo gave his idea of the relationship of education to crime as follows: "Every school that is opened causes a prison to be closed." "A parent who sends his son into the world uneducated, and without skill in any art or science, does a great injury to mankind, as well as to his own family, for he defrauds the community of a useful citizen and bequeaths to it a nuisance."

Age of Prisoners.

Under 20 years	12
20 years and under 30 years	250
30 years and under 40 years	1,370
40 years and under 50 years	590
50 years and under 60 years	197
60 years and under 70 years	66
70 years and under 80 years	15

The statistics concerning the age of these men is quite interesting. At this institution no prisoners under thirty years of age are received except the cases of men who have received life sentences.

It may be said of criminals in general that there are more criminals between the ages of twenty and thirty than of any other age and that the average age at which prisoners enter penal institutions is twenty-three.

According to our figures more men have entered the Indiana State Prison between the ages of thirty and forty. Old age is not free from crime, as may readily be seen from the above table. The crimes of the aged are generally the expressions of beginning or advanced mental disorders.

I have observed in a hundred and seventy-five cases of rape and attempts of rape that I have studied, that two-thirds of these sexual crimes were committed by decrepit and physically defective individuals, in whom the physical and mental signs of senile decay were evident.

In some instances in senile insanity, there develops a paranoid state with delusions which may be loosely organized, systematized and accompanied by auditory hallulcinations; consciousness is fairly clear and orientation is but little disturbed. The emotions are exceedingly unstable, and tears and laughter can be alternately produced in a space of a few seconds. Homicides are frequently a symptom of this form of senile insanity.

Approximately two per cent. of all admissions to the Indiana State Prison are for incest. But it no doubt occasionally happens that some of the men convicted of incest are innocent, and that blackmail, hysteria and fraud play a part in such convictions.

During the last five years four and eight-tenths per cent. of all the prisoners admitted to this institution were convicited of rape.

The average age of men convicted of rape admitted to the Indiana State Prison is forty-four years plus; ninety per cent. of them showed disorders of the nervous system and an increase or decrease of the tendon reflexes and a general condition of arteriosclerosis; seventy-three per cent. of them were married men in whom the habit of frequent intercourse was established; sixty per cent. of the cases of statutory rape were committed by men over fifty years of age.

Religion.

Members of churches	1,056
Non-members of churches	444
Confessed religious belief	2,300

These figures show that ninety per cent. of these prisoners were religious. By that I mean that this per cent. professed belief in some organized religion or creed. Not all of them, of course, were active attendants upon divine services, but no less than one thousand took active part in religious services. The average prisoner is a religious person. He believes in creeds, rituals and cermonies; they have a distinct psychological appeal to his nature, those religions especially which are rich in symbolisms. Negroes who already profess religious faiths such as the Baptist and Methodist became converted to the Roman Catholic faith; the ceremonies of this church have a great fascination for their childish minds. One-half of the prisoners professing religion were Roman Catholics.

Some of the men who are guilty of the most dastardly crimes, as rape on infant children, incest, sodomy, are most devoutly religious. One individual convicted of raping and murdering a young girl always said his prayers regularly several times a day and professed to be horror stricken when some of his companions had sworn while conversing with him. The profession of religion in general of these men does not seem to bear a direct relation to morality; they appear to regard these things as totally separate. They are intensely devout, but fear and not love, for their Creator, has governed their devotions. For them the profession and ceremonies of religions are easy, but the practice of morality in their social duties is well nigh impossible. As regards their religious professions they may be divided into three classes: (1) those who profess religion to impress their keepers with an idea of reformation to hasten their release from prison; (2) those who resort to religious exercises and professions of faith, rich in symbolism and ritualism, to secure a moral narcosis; (3) those who earnestly seek, as far as their warped judgments and emotional instabilities will permit, a real reformation in character.

I failed to find except on the very rarest occasions prisoners who were serious doubters of religion or intelligent agnostics or freethinkers. In fact, I can almost say without fear of contradiction that there might be one in every thousand cases.

On the other hand we have to recognize that religion is probably the greatest force brought to bear upon human conduct. Religion serves better for the suppression of crime than any police system that can be devised. Therefore we must always expect to use the element of religion in dealing with the prisoners. If we can provide that this great influence be made synonymous with morality in their personal lives, great good can be accomplished.

Use of Tobacco.

Chew	1,300
Smoke	1,800
Chew and smoke	1,700
Cigarettes	993
Non-users of tobacco	197

Prisoners as a class I found to be inveterate users of tobacco and most of them admitted that they began the use of this narcotic weed very early in life. It is very probable, however, that criminals do not use tobacco to any greater degree than do unconvicted persons. The figures within themselves are interesting, but one would be unwarranted in arriving at a conclusion that there was any definite relationship between the use of tobacco and crime.

Hereditary Taint of Insanity, Feeblemindedness and Other Psychopathy.

44 per cent., or	1,100

The term hereditary taint is used to indicate that the prisoner's family history showed epilepsy, feeblemindedness or insanity in his progenitors.

As to whether criminal traits may be inherited is still a question unsolved by criminologists, sociologists and psychiatrists. Many very prominent students of the criminal question have gone so far as to deny the existence of the inheritance of criminal characteristics *per se*. On the other hand, there are a few criminologists who still cling to the idea that criminal traits may be transmitted.

The results of the studies relating to this question are largely colored by the viewpoint of the investigator and of the previous conception he may have held concerning the matter. There are so many factors entering into an individual's life and behavior that it is practically impossible to pick from the ensemble of environment, economic factors, training, education, opportunity and heredity, and to say with accuracy that heredity was responsible in any given case of criminality. While this is the case the euthenists have been unable to bring sufficient data to disprove the claims of those who adhere to the direct inheritance theory.

My studies at the laboratory at the Indiana State Prison have shown very conclusively that criminality is indirectly inherited by reason of the fact that insanity, feeblemindedness, epilepsy and other forms of psychopathy are inheritable conditions and these states of mental defect are most potent in the production of crime.

It was found at our institution that forty-four per cent. of the twenty-five hundred men had a tainted heredity which was indirectly responsible for their crimes.

Use of Alcohoilc Liquors.

Abstainers	175
Moderate	250
Excess	2,075

One hundred and seventy-five of these prisoners professed not to be users of alcoholic liquors at all, two hundred and fifty admitted a moderate indulgence in intoxicating beverages, two thousand and seventy-five were given to the excessive use of drink, getting drunk at very frequent intervals. It will never be possible to accurately say just how much crime is due to drinking. Large numbers of prisoners are dipsomaniacs, they possess neuropathic organizations; to them drinking is an expression of their defect, a contributing factor to their crimes rather than the immediate one. The disastrous effects of the narcotic, alcohol, on the brain and central nervous system are to be seen every day throughout the civilized world. Acute alcoholic intoxication or the ordinary form of drunkenness, from a psychological viewpoint, is but a transitory form of insanity. "Both psychologists and jurists have properly, however, maintained a distinction between those mental disturbances produced by the direct imbibition of alcoholic liquids, and which cease in a few hours after the imbibition ceases, and those mental derangements and hallucinations that may continue for days, weeks, or months after all use of alcohol has ceased."

The exact relationship that alcohol bears to crime is problematical and cannot with mathematical precision be determined. Prison authorities and especially prison surgeons, know that many prisoners in order to excuse overt acts readily attribute their crimes to temporary states of drunkenness. Therefore statistics on alcoholism from penal institutions and reformers are to be taken *cum grano salis*, for they are more or less inaccurate.

The usual answer that I receive from prisoners, during my examination of them, concerning the cause of their crimes, is generally one of this sort: "I was drunk; I did not know what I was doing; I may, or may not, be guilty; I cannot remember." These excuses for crime are so common and so easily made that the courts are extremely reluctant to place any confidence or value in them. In many instances, however, they are absolutely correct concerning the state of consciousness and memory. The crimes of acute alcoholism are petty thefts, larceny, forgery, rape, incest, sodomy, assaults and homicides. Petty thefts, obscene exhibitions and sexual crimes have been noted in alcoholic pseudo-paresis. Alcoholic hallucinosis, which is attended by hallucinations, especially of the auditory variety and persecutory delusions of a sexual nature, lead to homicide and homicidal attempts.

I have observed that a large number of wife murderers committed their crimes when reacting to delusions of marital infidelity relating to their wives. The same crime producing delusions and auditory hallucinations are characteristic of alcoholic pseudo-paranoia. We usually find dipsomania to be dependent upon neuropathic heredity, diseased conditions brought about by trauma, lack of proper food, malnutrition and the inebriate is in fact a diseased person.

The best statistics show that from seventy to eighty per cent. of persons who drink spirits convulsively, and are called inebriates, have a defective heredity. All studies of the steady drinker show a profound and progressive impairment of all senses, functional activities of the body and reasoning. The more accurate the measurements are made, the more positive the deviation from the normal becomes.

"There can be little doubt but that much the larger number of those shocking homicides which disgrace the criminal annals of civilized countries, in which mothers or children, or both, have been suddenly slaughtered in the midst of the father's debauchery, have been the direct results of true paroxysms of *mania a potu*, such as we have briefly described. The medico-legal bearing of this class of cases deserves more thorough investigation than it has hitherto received. And as one attack of this form of mania leaves the patient more disposed to another whenever indulging in the use of alcoholic drink, they constitute the most dangerous class of inebriates."

It will be well to consider briefly the attitudes that society has entertained concerning alcoholism and responsibility. Lord Coke, of England, set forth the idea in his ruling in the seventeenth century that drunkenness and inebriety augmented a crime and misdemeanor and therefore called for an increase of punishment. For many years moralistic speculation and theories have determined in a large degree the attitude society has held toward drunkenness. The reformers and philanthropists have ever held the inebriate morally responsible. They have endeavored fruitlessly to rehabilitate the dipsomaniac by moral suasion, incriminations, insults and punishments.

It cannot be denied that moral treatments do exercise some influence in cases of inebriety, but they should always be secondary to medical and hygienic measures. Dr. Crothers, America's leading authority on alcoholism, convincingly states, relative to this phase of the subject, the following: "It is a delusion to interpret acts associated with premeditation and reasoning in inebriates as evidences of sanity. It is a delusion to consider inebriety and alcoholism as not impairing the sanity and integrity of the brain and body. It is a delusion to consider such persons as possessing free will and judgment with consciousness of their condition and ability of control. It is a delusion often repeated and has become incorporated in jurisprudence, that alcohol may be used to give capacity to commit crime. In reality this is true, but in a very narrow limit.

"The exciting stage following the use of alcohol might be limited to ten minutes or an hour, but after that there is no certainty that any act premeditated could be carried out. The fact is sustained by unmistakable evidence that all crimes committed by such persons are the acts of defective minds. All this signifies a recognition of the condition of the criminal, not to diminish the punishment, but to change it to more rational lines. Criminals of this class need control, care and changed conditions. They are clearly defectives and degenerates who have lost the power of rational thought and conduct."

The positions taken by our courts on the subject of intoxication are contradictory and illogical. If an individual in a state of intoxication makes a will, signs a contract, a deed, a promissory note, or a bank check, the courts of law do not hold such papers and testaments as valid or legal, if a proof of intoxication can be brought to bear. Law in this case questions and even denies the responsibility and the capacity of an intoxicated individual to execute a legal instrument. In the practice of criminal law this is quite the reverse. If a drunken man commits a crime while intoxicated he is held to be responsible and qualified to commit a crime. Yet psychologically and physiologically, the mental impairment, the lack of reason and judgment and the incapacity to act normally are just the same whether an offense be committed against the criminal or the civil law. Our conceptions concerning alcoholism and responsibility must change.

Society in general and law in particular still look upon an individual as a possessor of an absolutely free will. Is not this doctrine an unsubstantiated metaphysical hypothesis? Can we look upon intemperance as *prima facie* evidence of deliberate viciousness? This is hardly possible in the light of recent research.

It has been demonstrated beyond the shadow of a doubt that the dipsomaniac is always a neurotic. His nervous system is impaired by heredity, disease or trauma. The defects of his brain and central nervous system produce at intervals an insatiable, uncontrollable craving for alcoholic stimulants.

The medico-legal aspects of the narcotic drug habits need to be more carefully studied than they have been in the past. Eight per cent. of the prisoners received at the Indiana State Prison are users of cocaine, morphine or other narcotic drugs. Fully five per cent. of all crimes for which prisoners were committed to this institution were due directly or indirectly to the use of these agents.

The victim of morphinic insanity is absolutely a slave to the almost insatiable desire that possesses him to use opium or any of its alkaloids. The moral degradation and misery of oxymorphinism will lead the habitue into the performance of any crime in his efforts to secure morphia. The drug victims will commit larceny, burglary, forgery, arson, blackmail, homicidal attempts, murder and sexual crimes to satisfy their morbid cravings. Women have been known many times to prostitute themselves to secure the drug. A very large per cent. of the commercial prostitutes are morphino-maniacs. The psychopathic disturbances of morphinism frequently develop a depressive and melancholy character and these are attended by delusions of persecution and a tendency to suicide. Occasionally states of incoherence, confusion and mania are observed, during which periods homicidal attempts are frequently made.

Police surgeon Dr. Guimball, who has had a wide experience with criminal drug habitues, says: "First, morphine causes defects of attention, particularly of sense observations; second, the ethical sense is blurred, the victim is unable to discriminate any moral basis that should dominate, he acts from impulse; third, his will is lost and power of control over the impulses lessened, both physical and mental impulses dominate him from the slightest exciting causes; fourth, the morphinist is literally a lunatic, only more subtle and concealed, like the dipsomaniac he is liable to be dominated any moment by impulses that are unforeseen; fifth, the responsibility, like judgment, is impaired and enfeebled; he is constantly doing acts and saying things the import of which he does not understand."

The criminal manifestations of cocaine insanity are essentially those of morphinism, except possibly they are slightly more profound. The cocainists as a rule are very easily irritated and their conduct is largely governed by violent impulses. Pronounced changes in their character take place. The patients become dishonest and deceitful, and seem to possess a morbid propensity for lying. The will power is markedly enfeebled, all sense of moral or legal responsibility is weakened, reason and judgment are greatly impaired. The development of a paranoid state is a very common occurrence. The victim develops and entertains delusions of a persecutory nature; he becomes suspicious of his wife's attitude toward other men. Frequent homicidal assaults grow out of these delusions of marital infidelity. Erlenmeyer has observed that the sudden withdrawal of the drug from the cocaine fiend often induces a profound state of depression and delirium which is accompanied by persecutory delusions that render the individual an extremely dangerous person. Suicide is not an infrequent termination of chronic intoxication.

The following group of statistics speak for themselves and do not need, so far as this article is concerned, any explanation or comment. They may be of special interest to the sociologist and criminologist.

Age Leaving Home.

Five to ten years	165
Eleven to fifteen years	690
Sixteen to twenty years	784
Twenty-one and over	834
Unknown	27

Civil Conditions.

Single	812
Married, living together	845
Widowed	248
Divorced	316
Separated	279

Habits of Prisoners' Parents.

Intemperate fathers	859
Intemperate mothers	24
Both parents temperate	1,325
Both parents intemperate	150
Unknown	63

Civil Condition of Parents.

Parents living together	456
Parents separated	224
Father dead	453
Mother dead	63
Both parents dead	983
Unknown	321

Age of Prisoners.

Under 20 years	12
20 years and under 30 years	250
30 years and under 40 years	1,370

40 years and under 50 years	590
50 years and under 60 years	197
60 years and under 70 years	66
70 years and under 80 years	15

Number of Former Prison Convictions.

One	528
Two	365
Three	387
Four	126
Five	54
Six	32
Seven	9
Eight	10
None	989

Terms of Sentence.

Death	9
Life	261
20 to 30 years	3
10 to 20 years	48
5 to 21 years	2
5 to 14 years	40
3 to 15 years	28
3 to 14 years	4
2 to 21 years	233
2 to 14 years	661
2 to 10 years	2
2 to 5 years	61
1 to 14 years	347
1 to 8 years	585
1 to 7 years	79
1 to 5 years	62
1 to 3 years	24
6 months to 5 years	19
Criminal Insane	32

The most interesting of all criminological work, and in fact the principal aim and duty of a psychopathic laboratory in a prison, is to determine the relationship of mental defect to crime.

Mental Diagnosis.

Active	500
Fair	250
Dull	175
Feebleminded	675
Insane	250
Epileptic	200
Psychopathic	450

In treating this question I have endeavored to show how crime is sometimes a part of the symptom-complex of the various mental diseases. Each form of the essential insanities will be dealt with separately in the following order epileptic insanity, paranoia, general paresis, cerebral syphilis, manic-depressive insanity, dementia praecox, senile psychoses, traumatic psychoses, puerperal insanity, hysterical insanity, psychopathic personalities, constitutional inferiorities and feeblemindedness.

Epilepsy.

History is replete with examples of the causal relationship that this disease has sustained to delinquency. The remotest ages of antiquity furnish us very striking instances.

Mythology tells us that Hercules murdered his wife, Ophelia, and their children, during one of those unconscious automatic states that are characteristic of epilepsy. Seneca tells us: "One day, as Hercules was offering a sacrifice to Jupiter, he suddenly stopped, rolling his bloodshot eyes in a hideous manner, the saliva ran down his beard, his smile was convulsive and strained, and laying aside his garments, he became very much agitated. They thought he had returned to his senses, when he suddenly rushed to his weapons, ran after his father, his own children, and everybody, till finally he slew his wife and children. He was about slaying his father when Pallas appeared and checked him, throwing him on the ground. Then he quickly fell into a profound sleep. As he awoke the sight of all the slain around him terrified him and his despair became extreme when the news was broken to him that he alone was the author of all this slaughter."

Epilepsy is probably responsible for more pathological offenses than any other form of positive mental disease. It is very common for prison physicians to observe that many prisoners have distinct dizzy spells, and these are many times true forms of petit mal which may be overlooked by a careless mental examination.

Marked changes in the morals and the emotions are most constant characteristics. The epileptics, as a rule, are most mercurial and volatile in their temperaments; the merest trifles are sufficient to stir them to serious outbreaks of temper and violence. They are radicals of the most extreme type, and especially this is true in the sphere of religion and politics.

Their manner of living and their modes of behavior are practically regulated by their appetites; they love power and notoriety, and they shrewdly use immoral and illegal methods to secure these; they are extreme sensualists and they are prone to commit sexual crimes as rape, incest and sodomy.

Delusions of persecution are common characteristics of the epileptic mental degeneration and therefore it is very easy to see why dangerous assaults should be so common among epileptics with their hair-trigger temperaments, their lack of emotional control and their impetuosity.

Clouston has well said that, "Murder by an epileptic should be looked upon as being as much a symptom of his disease as is larceny by the general paretic."

Delasiauve forcibly stated: "It is certain that on passing an epileptic, we elbow one who might be an assassin, and that epilepsy, through the delusional ideas it originates, furnishes a considerable share of the crimes ascribed to mental alienation."

The phenomenon of epileptic automatism has long been observed, but a concise explanation of this phase of the disease has not as yet been offered. We know, however, that some epileptics complete certain definite acts in a seemingly perfectly conscious and coherent manner. But in reality consciousness is practically blotted out, and when the individual regains his mental status, there is likely to be no memory of any of the acts that he may have committed during such periods, or if he does have any memory it is usually but an indistinct hypnogogic idea that closely corresponds to the dream-state.

The automatic acts of the post-epileptic stage more frequently follow the petit mal paroxysm and it is rare for criminal acts to be committed following a severe form of the major paroxysm. It is usually the rule that the actions which are performed in a post-epileptic automatic state are always the same in character; the act performed usually portrays in some manner an habitual movement that is customary to be made in normal consciousenss. And in the consideration of epileptic criminal acts we must bear these facts in mind. If called upon to give expert testimony as to the responsibility for criminal acts that may have been performed by an epileptic in the post- or pre-epileptic automatic state we must determine if the overt act was habitual in any character or if the person was accustomed to performing similar actions when "at himself."

It would be in perfect harmony with the observations that have been made to find an epileptic butcher having assaulted another individual with a knife, nor would it be strange to find a soldier in a post-epileptic state shooting an individual.

The handling of a gun or knife are habitual acts of the soldier and butcher respectively; but should a butcher kill an individual by administration of poison, we should be exceedingly slow to regard such a crime as an expression of epilepsy, since the handling of drugs is a foreign procedure to the act of cutting meat.

The condition known as psychical epilepsy is one in which the paroxysm is replaced by a nervous storm which is not accompanied by the usual signs of epilepsy. "Psychic epileptics may commit all manner of crimes; thefts, arson, rape, assaults and homicides. They are not infrequently pyromaniacs, entirely without reason or impelled by the flimsiest motives."

"The medico-legal aspects of this type of epilepsy depend, so far as responsibility is concerned, upon our ability to determine the existence of the automatic state at the given moment. This may be difficult to do beyond reasonable doubt, though if we can prove the person is a sufferer from epilepsy at the time, or ever had it in any form, we can always create a reasonable belief that the patient may have acted while in a seizure, without any intent whatever, and under conditions that should free him from responsibility.

The evidence of the presence of epilepsy * * * * needs to be carefully studied in order to arrive at a just conclusion in medico-legal cases. If it can be proven beyond reasonable doubt that the individual has epilepsy, the question of responsibility is not difficult after that. We may not be able, it is true, to say positively that he was under the influence of a seizure at the moment an overt act was committed, while, on the other hand, we are equally as unable to prove that a seizure was not present. Psychic convulsions defy all ordinary methods of detection. They can readily be noted, however, by one trained in the observance of their expression."

Paranoia and Paranoid States.

Paranoia and allied paranoid states furnish us with a very large quota of pathological crimes. The most common of these are homicides, homicidal attempts, assault and battery, blackmail, perjury, impersonation of officers and sexual crimes. The most dangerous of all insane patients is the one who harbors in the recesses of his diseased mentality systematized delusions of persecution. This is especially true of the paranoiac, who many times appears to be intellectually normal and occasionally, aside from his paranoidal tendencies, he may be the superior of the average individual. The proper perspectives of life are impossible for the paranoiac since each instance and circumstance is colored and tinged by an abnormal sensibility and reaction to the most common place and trivial affairs.

The paranoiac in the stage of persecution, out of the most insignificant circumstance, constructs a nebula of persecutory ideas which are intangible and obscure. Finally these hazy, indistinct ideas of persecution take a more definite character, and then, step by step, supportive and contributive ideas are formed and elaborated which build up a definite, systematized, delusional preconception or system of thought through which must pass every idea that is translated into action.

This delusional formation is so closely and intimately connected with the whole of consciousness, that it regulates and dominates the individual's manner of feeling, thinking and acting. It is easy to see, therefore, that any paranoiac is a potential homicide while harboring delusions of persecution. Should he believe that his supposed enemies have designs upon his life, or that they desire to make him the butt of their ridicule, or the object of some diabolical conspiracy, it is not at all strange that the persecuted should turn persecutor.

He employs logical methods of argument to convince himself that he is perfectly right in seeking means to protect himself against machinations, and should he ever be called into court to explain some of his erratic behavior, he is more than convinced that he is justified in seeking any measure that he may see fit to employ.

Paranoiacs of the religious variety often come into conflict with the law directly through their insane beliefs concerning religion, and examples of religious paranoia are not uncommon. They often feel that they have been commissioned by God to deliver humanity from its sin, or to perform some other mission which the Deity may have imposed upon them, and while many of the religious mystics are extremely harmless, there are those who are decidedly dangerous to society when anyone attempts to contradict their insane ideas, for they regard such imputations as direct sacrilege and effrontery to Deity and may feel themselves designated to kill those who denied their religious pretentions.

The socialistic orators of the curbstone variety, the propagandist and religious reformers who become leaders of such anarchistic organizations as the I. W. W., or of such societies as the Holy Rollers, are individuals of the paranoid type.

General Paresis.

The crimes of genral paresis as compared to epilepsy, dementia praecox and paranoid states are comparatively rare. Of two hundred and five admissions to the Indiana Hospital for the Insane Criminals but five patients were general paretics.

The criminal offenses of general paralysis generally fall into one of the following categories: immorality, alcoholic debauch, indecent behavior, thievery, dishonest speculation, forgery, and very rarely homicide and suicide. The misdemeanors of paresis generally occur in the incipient stages of this disease. The moral qualities of the mind share in a very large way in the general degeneration. Very often the moral symptoms are the first to point to paresis. The paretic fails to understand and seems entirely oblivious to the moral relations that he sustains to society and his family. His speech, which was formerly chaste and decent, becomes filled with profanity and obscenity.

The once temperate individual indulges in wild alcoholic debauches, and the formerly respectable husband and father seeks the company of the public prostitute openly and without shame.

"Volition, as the highest function of the mind, is one of the first to suffer in general paresis. The loss of control, both of actions and of ideas, is one of the earliest symptoms, and in the fully developed stages there is no longer any volitional direction of the thoughts, and consciousness is filled with the creations of a morbid phantasy, and with such sensorial impressions as chance to rise. This feature of will power and of all persistency of purpose makes the general paretic a comparatively easy subject for management."

The paretic manner of committing misdemeanors, and the environments and circumstances attending them generally, leave room for little doubt as to the source and nature of their real origin. The patient has no apparent knowledge of the quality and nature of his overt acts. The paretic seldom tries to hide his crime and he displays no foresight or caution. If on a tour in a department store, the rich and well-to-do patient may steal articles of small value, such as handkerchiefs and gloves. He will pocket them under the eye of the clerk in a state of apparent forgetfulness after having examined them as a prospective buyer.

Magnan recites the case of a paretic who asked the aid of a policeman to help him steal a barrel of wine. The perfect frankness, innocence and apparent reasonableness of the request made upon the policeman, so impressed him, that he assisted the paretic to carry out his theft.

"The apparent kleptomaniacal propensities of the general paretic consist mostly in an automatic appropriation of whatever articles attract his attention rather in any perverse desire to steal, and in the demented stage he still continues to accumulate things when he is no longer capable of making any distinction as to ownership."

Under the dominating influence of grandiose delusions, the victim of paresis forges checks, makes fraudulent claims on property, gives false promissory notes, makes wild speculations in the market and undertakes impossible financial operations without apparent knowledge of the quality of his acts.

Cerebral Syphilis.

Psychopathic states are likely to develop during any stage of syphilis, but they more commonly occur during the secondary and tertiary periods. They appear in the form of a delirious mania or acute depression. There is a profound disturbance of the moral and emotional qualities. The maniacal excitement may consist of any degree of psychomotor activity ranging from simple cerebral excitement to a state of mania attended by automatic agitation, incoherence and violence. After this state of mental alienation, there may follow a mental lethargy and sluggishness, a clouding of consciousness, a defective ideation and a perversion of the sentiments. In the depressed from of acute syphilitic insanity, the patient is often exceedingly morose and sullen, he may entertain delusions of persecution, he may be fearful of poisoning or of secret enemies; the delusions are usually attended by olfactory, gustatory and aural hallucinations.

"In some cases the psychical defect may show itself in the field of the moral sentiments by indifference, brutal conduct, selfishness, and a tendency to revelry.

"Among the early symptoms are irritability, culminating in alarming explosions of anger or in acts of violence. Suspicion, too, is heightened, and takes the form of delusions of persecution. These delusions often arise from the many strange and annoying sensations to which the patient is subject, and which he seeks to explain by reference to external agencies. Thus the paraesthesiae are attributed to electricity or irritating gases, which enemies use as a means of torment. The hallucinations of taste and smell, which may be due to local syphilitic processes, lead to delusions of poisoning or of foul odors, which patients believe are generated in their rooms at night to injure their health.

"Hallucinations of sight and of hearing are also common, and they are often the result of specific lesions of the organs of sense; their general character, furthermore, is disagreeable, like the prevailing emotional tone, and they sometimes re-enforce, and at other times they are the sole origin of the delusions of persecutions.

"The diagnosis of syphilitic insanity must rest not only on the history of specific infection, but also on the actual presence of syphilitic lesions, which may reasonably be supposed to bear a causative relation to the mental disease. If the physician is called to pronounce an opinion in a case with something like the following medley of symptoms, he need not hesitate to diagnose syphilitic insanity. These symptoms are not all supposed to be present in a single case, and a few of them would suffice for a diagnosis; they are chiefly as follows: great irritability and violent outbreaks of temper, confusion of ideas and loss of memory, exacerbations of mania or of hypochondriacal melancholia, and a constantly progressive dementia, accompanied by cephalalgia, insomnia, vertigo, syncope, apoplectiform attacks, sudden and temporary paralysis of cranial nerves, loss of power in single muscles or in one arm or leg, loss of sight and optic neuritis or loss of hearing, and sudden and unaccountable remissions in all the symptoms."

Manic-Depressive Insanity.

The crimes of the manic-depressive psychoses are relatively infrequent.

The alternate cycles of good behavior and freedom, crime and imprisonment which I have noticed in habitual criminals somewhat resemble the manic-depressive psychosis with its intervals of lucidity, separated by periods of depression and excitement. In the period of remission of the cyclic form of criminality the prisoner is exceedingly well behaved and often takes a very active part in the religious services and societies at the prison, and often it is thought this individual has reformed and that he will become a model citizen. He is sooner or later discharged from prison and he does exceedingly well for a limited period of time. But shortly our hopes are dashed to the ground, for a second cycle of criminality develops; new crimes are committed and the individual is returned to the prison from which he was but recently discharged or is sent to some institution in another state.

Depressive Phase.

The most common violent act of this phase is suicide.

All melancholic patients are potential suicides, and in a state of raptus this act is frequently performed in public and without premeditation. The depressive patient sometimes becomes so occupied with a single idea that it amounts to an obsession. These ideas are often very terrifying and brutal, and because they occupy the entire field of consciousness, there often develops a state of "raptus melancholicus," in which their absorbing obsessions are translated into murder, vicious assaults, mutilations of the body, especially those of the genitals and the most painful forms of suicide.

Consciousness is markedly clouded in these outbreaks by delirious passion, and the memory, if retained at all, is imperfect and hazy concerning any actions performed during this period. In the state of raptus guided by a delusional sympathy, a mother will murder her children to protect them from hardship, trials and supposed evils with which she thinks they are threatened.

An individual once made an attack on an English king, knowing that such a crime would result in his death; he was impressed with ideas of his own sinfulness and unworthiness and thought that his own death was necessary for the good of humanity, but because he was so scrupulous about the sin of suicide, he assaulted the king, knowing that the punishment for this act was death.

Manic Phase.

The crimes of the manic phase are also rare. The extreme psychomotor activity interferes with the accomplishment of definite criminal acts. The patient is destructive rather than criminal; he is given to the demolition of furniture, mirrors and window panes. They not infrequently disturb public peace by running amuck through public thoroughfares. They often frequent saloons, and indulge heavily in liquor, thereby becoming obstreperous and unruly in public places. The ordinary womanly modesty is frequently lost in the manic phase.

The female patients of this type are often arrested and charged with public indecency and exposure. Nymphomania, kleptomania and dipsomania are not uncommon symptoms.

The maniacal excitement occasionally assumes a character of extreme fury and frenzy during which vicious assaults and homicides are committed.

Dementia Praecox.

The crimes of those suffering from dementia praecox partake of the fundamental basic characteristics of mental enfeeblement that mark this psychosis.

The misdemeanors and unlawful offenses of those affected with this disease are characterized by more or less defect of reason and judgment, a marked emotional poverty, a more or less complete state of indifference, a condition of puerility and often a thoughtless, senseless, and impulsive brutality.

A very large number of the violations of the law committed by insane persons are directly chargeable to dementia praecox.

"Many of these cases go to swell the ranks of the criminals, the prostitutes, and hoboes, and are often mistaken for cases of feeblemindedness. Wilmans, in a study of one hundred and twenty-seven vagabonds, found sixty-six cases of dementia praecox."

Cases of arrested dementia praecox are often noted in prison. In these types of this disease, the progress of the underlying dementia is inhibited, and though the psychosis fails to reach a stage of dementia, the individual never again reaches his own normal mental status.

A distinct difference corresponding to the three main divisions of dementia praecox is shown in the character and the circumstances attending the crimes committed by the patients with this disorder.

The crimes and misdemeanors of hebephrenia partake of the character of this form of dementia praecox—the crimes are petit larceny, trespass, vagabondage, drunkenness, the breaking of box-cars, sexual offenses, and public prostitution in the female.

The offenses which ofttimes go to make a part of the catatonic symptom-complex occur with much less frequency than in the paranoid and hebephrenic form.

The crimes and misdemeanors of this type are marked by impulsiveness, a lack of premeditation, thoughtlessness and usually no effort is made by the patient to escape the consequences entailed by criminal actions. The catatonic makes vicious assaults, commits murder, and destroys property by incendiarism.

The paranoid form furnishes a large number of criminals; the delusions of persecution lead to assault, homicides, theft of property, blackmail, and perjury.

The crimes of hebephrenia and paranoid dementia praecox are about equal in number.

Senile Psychoses.

It is commonly observed that, as the period of senescence approaches, the fires of passion are cooled, the ambitions of youth are quieted, the scheming and planning of youthfulness for the future successes and work to be accomplished ceases, and all is changed into a life of reminiscences, metaphysical and religious speculation. We pay the proverbial reverence for gray hair, the stooped form, the slow, unsteady, tottering gait, and for the kindly human sympathy so characteristic of the aged.

In marked contrast, this senile period of mental and physical decay is not always attended by a peaceful and undisturbed serenity. Occasionally there is a profound moral deterioration; an even quiet spirit gives way to excessive irritability; the senile dement objects to any change in his manner of living; he becomes exceedingly egotistical and unreasonable; he makes senseless demands upon his wife and children, and it is not an uncommon occurrence for vicious assaults to be made on them, should they neglect his slightest whim.

The formerly chaste and respected individual becomes intemperate, his conversation is filled with coarse and obscene remarks. Satyriasis is not an uncommon symptom, and this manifests itself in acts of rape, especially on young female children, or by disgraceful or bigamous marriages and indecent exposure of person.

I have observed in a hundred and seventy-five cases of rape and attempts of rape that I have studied, that two-thirds of these sexual crimes were committed by decrepit and physically defective individuals, in whom the physical and mental signs of senile decay were evident.

In some instances of senile insanity, there develops a paranoid state with delusions which may be loosely organized, systematized and accompanied by auditory hallucinations; consciousness is fairly clear and orientation is but little disturbed. The emotions are exceedingly unstable, and tears and laughter can be alternately produced in a space of a few seconds. Homicides are frequently a symptom of this form of senile insanity.

Regis, in speaking of misdemeanors and crime of senile insanity, says: "Their actions all carry the stamp of dementia. They are: absurd and infantile thefts, like those of general paralytics, but even more foolish; sudden and causeless fits of passion; ridiculous and heedless attempts at suicide; there are also especially libidinous actions, obscene exhibitions of themselves in public, attempts at rape, unnatural crimes, all resulting from lack of conscience and absolute loss of the feeling of modesty.

Arteriosclerotic Dementia.

The unlawful acts of this psychosis are essentially the same in character as those of senile dementia, with the possible exception that homicide and homicidal attempts are slightly more frequent because of the paranoid nature of the delusions and hallucinations entertained by this class of patients. Their crimes usually show a little more premeditation, lucidity, provision and foresight to escape the consequences of illegal acts.

Traumatic Psychosis and Traumatic Psychopathic States.

The term traumatic insanity has been applied to a certain group of psychotic symptoms of more or less definite clinical character, the origin of which may be traced to some injury to the head or the spine.

These psychic symptoms occur more often in those cases in which there has been an extensive injury, great pressure or concussion to the brain substance, than in those in which the cerebral injury is restricted to a single limited area.

The mental symptoms following a head injury may often be divided into two classes, namely, a delirious state, and one of mental enfeeblement.

Crime more frequently occurs as a symptom in the condition of traumatic feeblemindedness than it does in the state of traumatic delirium.

Immediately following an injury to the head or spine there may develop a state of unconsciousness which lasts a longer or shorter period of time. When consciousness is regained, the patient usually fails to remember anything of the accidents or happenings that occurred a short time before. Ordinarily after the injury the subject is soon restored to normal, and for weeks, months, or even years, he may not display any signs of mental failure.

The first symptom of the mental disorder that is noted is an insidious change in the patient's disposition; he becomes egotistical, irritable, fault finding and morose; he has periods of despondency and depression; he worries about his health, financial matters and kindred affairs; his moral sense becomes weakened, his judgment and reason are impaired, violent outbreaks of temper occur, and to allay his unpleasant and distraught feelings he often resorts to the excessive use of alcoholic beverages, to which he shows a pathological reaction.

The psychopathic state just described creates a most favorable disposition for the perpetration of crimes and misdemeanors and the instances are by no means rare in which the violation of the law show their direct origin to cerebral trauma.

Puerperal Insanity.

Puerperal insanity is a generic term applied to certain psychotic symptoms which occasionally attend the physiological epochs of pregnancy, parturiton and lactation in those who possess a hereditary predisposition. The causal factors operating to produce this psychosis are the lack of proper medical attention at the time of childbirth, the infection and exhaustion, shock and hemorrhage, the mental anxiety and fear attending this physiological cataclysm. It has been claimed that this mental disturbance takes place about twice as often in illegitimate pregnancies as in legitimate ones. This fact seems to indicate that the psychogenic factor of worry, remorse and shame exert a tremendous influence for the production of this disorder.

Occasionally violent states of mania and frenzy are noted in puerperal insanity and during these periods of great motor excitement, restlessness and delirium, criminal acts are committed, and chief among them are induced abortion, infanticide, suicide and homicide.

A large percentage of infanticides may be charged to the insanity attending the puerperium. It is a strange perversion of the maternal instinct for a mother to murder her helpless offspring, and in every case of puerperal insanity, the infant should be taken from its mother.

It seems as if this mental disorder is not alone confined to human beings. It is a well-known fact that horses, cows, rabbits, squirrels and cats often kill their young at the time of birth or soon after. It is a very frequent occurrence for a female hog to kill and devour her entire litter.

"When the disease develops at this time, delirium is common, particularly in cases occurring early—before the fourteenth day. Here also there are, in at least half the cases closely observed, prodromal symptoms during pregnancy. These symptoms may have been overlooked or the offset may arise with startling suddenness accompanied by suicidal or homicidal tendencies. Fever, which is commonly present, may be very high in septic cases. If the patient is maniacal, which is the most common type, she is sleepless and violent and attempts to destroy those about her. There are delusions and hallucinations. The ideas and language of the patient flash from her with remarkable rapidity and incessant change. Now sensuous, obscene, profane, and making attempts at self-exposure; in an instant she may revert to religious ideas, to indulge in prayers and the singing of hymns. In one case, that of an illegitimately pregnant colored girl of nineteen, the writer was thought to be the Almighty, from whom the girl piteously besought pardon for her sins. The moment while counting her pulse he was turned upon with a frenzy from which he barely escaped, the patient, now terrorized by his presence, believing him to be Satan himself, upon whom she spat with fury. Within a very short time he left her singing a Sunday school song, which was soon followed by word pictures of obscene situations mingled with revolting profanity. Melancholia in the puerperium occurs less frequently than mania—usually after the fourteenth day—and it is very apt to be accompanied by persistent attempts at suicide, requiring unremitting watchfulness on the part of the attendants; delusions involving frequently the husband's fidelity, and hallucinations of sight and hearing are commonly present."

Hysterical Insanity.

It is not at all to be wondered at that crimes, misdemeanors and the violations of morality should be found in the symptom-complex of hysterical insanity.

The exaggerated impressionability to external stimuli, the abnormal tendency to simulation, the excessive emotionalism, the volitional impairment, render the patient a plaything of his whims and passion, and the easy victim of evil circumstances.

The combination of these named psychic attributes of this mental anomaly create or constitute a condition of moral inco-ordination.

Delusions of persecution are to be expected in the hysteric whose abnormal sensitivity to the slightest irritating trifles translates the most common relations of life into schemes and machinations for his injury. And it naturally follows that homicidal assaults should grow out of this disordered paranoid state of mind.

The basic eroticism of hysteria leads to sexual crimes; the hysterical ascetic in his life of imperfectly impressed sexual desires and celibacy often sinks to a state of homosexuality, which finds relief in such sexual crimes as sodomy and bestiality. Other hysterics, through fear of venereal disease, through a dread of shame, and a horror of being detected in illicit sexual relations, frequently commit rape on infant children.

Individuals of this type are to be found in every prison. Often overt acts are perpetrated in the periodic episodes of this psychoneurosis that are attended by states of amnesia.

"Many of the cases of blackmail and false accusations against physicians may be credited to this form of hysteric derangement in females, and we have known one or two striking instances of the kind. One, a young woman, well connected, but cut loose from her family and rather repudiated by her relatives, used to frequent doctors' offices and have hysteric attacks there, and in one or two cases, at least, attempted to get up compromising situations, and once succeeded so far as to give considerable mental uneasiness for a time to a rather prominent physician. There are cases on record where still more serious consequences have resulted; men have been convicted of crimes of which they were innocent on false tesitmony of hysteric women.

"While this special form of mental disorder is by far most frequent in the female sex, it is not unknown in males; of course, in these cases the symptoms are somewhat modified, but it occurs only in men with somewhat abnormal and feminine mental organizations. In some of these, sexual perversion is a notable symptom, and it seems probable that this hysteria is at the bottom of many cases of this abnormality.

"In male hysteric insanity we see many of the same tendencies to morbid emotionalism, eroticism, false accusations, the exaggerated suggestibility, certain kinds of delusive conceptions, occasional threats or apparent attempts at self-injury or suicide, refusal of food, etc., that we observe in the female, but active hysteric convulsive attacks are very rare, and the well-marked hysteric physical stigmata are also uncommon. Male hysteric insane are more likely to be suicidal or homicidal than are the females.

"Something may be said in regard to traumatic hysteria, which sometimes amounts to a kind of insanity, showing itself in an exaggerated valuation of physical disabilities and a certain moral weakening that leads the individual to overact and sometimes simulate. There are probably sometimes actual hallucinations and certain delusive conceptions. These cases may be regarded as rare, though hysteria from this cause is common. They have chiefly a forensic importance."

The hysterical type of prisoner is the *bete noire* of the prison-surgeon. He is irritable, quarrelsome, goes about seeking to provoke an argument, constantly complains he is ill-treated by the prison officials, that unfair tasks are assigned him, that the fellow prisoners steal his tools and delay his work.

He constantly makes demands for interviews with the disciplinary officer; he is rebellious at discipline. He finds the obedience to the prison's simplest rules a hard task. At other times he is extremely cheerful, vivacious, and his actions are liable to overstep the bounds of prison convention. This brief period of apparent improvement in conduct is usually followed by a train of hypochondriacal complaints.

This type of prisoner comes to the sick line every morning. One day he complains of precordial distress; the following day he confidentially tells the prison physician that he has very frequent nocturnal emissions, that he is troubled with nightmare and insomnia. At the next morning's sick call he gives a new revelation concerning gastric disturbances with which he suffers. In a few days he becomes extremely depressed and melancholy. He imagines himself the victim of conspiracy by the officials of the institution. He becomes lachrymose and he relates his grievances to his fellow prisoners to create sympathy. Failing to do this he frequently pretends to attempt suicide. Should this fail to arouse the sympathy which he morbidly craves, he frequently becomes maniacal, throws his food on the floor, breaks the dishes, tears his clothing and talks in an incoherent and senseless manner. After a few days, whether placed in the hospital or not, his mental condition returns to its normal state and in course of time another cycle of such behavior and conduct is again enacted.

The hysterical criminals constitute possibly four per cent. of the insane cases in prisons among the male prisoners, and this percentage in much higher among the female delinquents.

Dr. Spaulding, of the Woman's Reformatory in Massachusetts, stated, in a recent report, that eleven per cent. of the female offenders showed manifestations of hysteria.

It has been noted among female prisoners that maniacal hysterical outbreaks occur very frequently and more especially at the time of the menstrual periods. The following stenogram is taken from Mrs. Mary Carpenter's "Female Life in Prison": " 'Miss G., I'm going to break out tonight.' 'Oh, nonsense; you won't think of any such folly, I'm sure.' 'I'm sure I will.' 'What for?' 'Well, I've made up my mind, that's what for. I shall break out tonight. See if I don't.' 'Has anyone offended you or said anything ' 'N—no, but I must break out.' 'And then you will go to the dark cell.' 'I want to go to the "dark.".' And the breaking out often occurs as promised; the glass shatters out of window frames; strips of sheets and blankets are passed through or left in a heap in the cell; the guards are sent for, and there is a scuffling and fighting and scratching and screaming that pandemonium might equal; nothing else."

Psychopathic Personalities and Borderline States.

There is a group of psychopathic indivduals whose mentalities lie in that ill-defined state where sanity shades imperceptibility into insanity, where the markings between responsibility and irresponsibility are hazy, indistinct and confused. Because of this lack of mental equipoise, they are very potential lunatics or criminals.

These persons constitute a very much greater portion of the defective delinquent class than do the criminals of the positve psychoses.

For purposes of description the individuals of this type have been variously designated as psychopaths, constitutional inferiors and sexual perverts, and they will be briefly described.

The psychopaths constitute a group of individuals who may be said to be "semi-insane or semi-responsible." The following is a description of the psychopath by Dr. Parker: "In the psychiatric sense he is neither flesh nor fowl, neither sane or insane, and he is a dangerous individual at every stage. He is bright, responsive, reactive and in a varying degree adaptable for certain periods. He is antisocial either for brief periods or persistently."

There are individuals who display many eccentricities of character and conduct. But these characteristics seem to be no departure from the individual's usual manner of feeling, thinking and acting, nor are they sufficient to warrant calling the individuals who possess them insane. Yet these characteristics in question hinder the efficient adjustment of the individual to his environment. It is noted that a positive insanity is a very frequent development in these cases. They have been graphically described by Regis as follows: "Their lives are one long contradiction between the apparent wealth of means and poverty of results."

Their mental twists, so to speak, make it impossible for them to live at ease in their environments. Their distorted mental perspectives lead them to magnify the wrongs they see in the social organism.

They are dreamers, reformers, propagandists and curbstone socialists; and should they come into conflict with the law, they assert that the wrong lies with society in its laws and not with themselves.

The psychopath is often the victim of obsessions and imperative ideas. While in the majority of cases they are limited to harmless results so far as society is concerned, they may, however, occasionally lead to the performance of criminal acts.

"It is not to be thought that crimes of obsessive origin present diagnostic difficulties from the medico-legal point of view. Before he obeys the criminal impulse, the patient is deeply grieved about it; he upbraids himself, and does his best to restrain himself. He is ready to suffer the most painful forms of treatment—isolation, preventive correction, etc. If, in spite of all efforts, he succumbs to the obsession (a very rare and almost impossible eventuality), he can show a hundred facts that testify to the morbid origin of the offense and prove its fatal determinism, excluding every possibility of criminal responsibility. As it is superfluous to prove, the ordinary inciting cause of a crime is absent. On the other hand, it is evident that there is a psychopathic cause which is capable of becoming a paradoxical incentive; the offense is committed because it has become an obsession, and it is an obsession because it is repugnant to the honest, gentle and sensitive character of the alleged criminal."

Constitutional Inferiors.

The largest single group of criminals that I have studied may be classified under the term "constitutional inferiors." The term is self-explanatory. While the individual of this group is not feeble-minded in the strict sense of the term, he is below par either physically or mentally. He is unable to stand the strain imposed upon him by the ordinary conventions of society; without assistance he cannot occupy the place that he should in the social order. Indecision, inability, vacillation and dependency are his chief characteristics. He readily takes to every vice that comes across his path, he indulges in prostitution, falls an easy victim to the drink and drug habit. His mental operations are slow or inaccurate; his reason and judgment are defective. The constitutional inferiors possess an unsatisfied craving for continual and unusual excitement, and in their impetuous endeavors to secure it they live on the borderline of insanity and criminality, over which they are swept back and forth by the force of tempting circumstances in which they often find themselves. In them the call of the Wanderlust is particularly strong; they travel from place to place, and the railroad employees and detectives in particular can testify to this fact. With the coming of warm weather hundreds of them traverse the continent in search of contentment, which leads them a never-ending chase. Many of them are convicted of petty crimes and a very common one for them to commit is the breaking of box cars to secure food and small plunder.

The treatment to be attempted in this class is the removal of these physical conditions brought about by dissipation and venereal disease, removal from vicious and bad associates, re-education and tactful direction of their thoughts and activities into channels of usefulness. If it were possible to transform their restlessness and unproductive activity, and if employment could be secured that would in a measure afford them novelty and excitement, their rehabilitation might be expected if it were not for their neuropathic organizations.

There are to be found in this constitutionally inferior class of persons a group of individuals to whom the term pathological liar can be applied with a marked degree of descriptive accuracy. This tendency to excessive prevarication has its origin in the higher types of mental defect and especially in those cases where there is a marked degree of emotional instability and a lack of mental equilibrium.

These individuals are the gossips of the prison. They seem to take a particular delight in spreading unfounded, senseless rumors and falsehoods about the institution;

they are sincerely hated and distrusted by the other prisoners. Very often they make confessions of crimes which they never committed merely to gain notoriety and the attention of prison officials.

In one instance, there came under my notice one of these morbid liars who made a confession that he committed a murder. He was in reality not guilty at all, but on the strength of his confession he was convicted in court and sentenced to life imprisonment.

Sexual Perverts.

There are very many sexual perverts to be found outside of penal institutions and hospitals for the insane. We are only interested with those sexual anomalies, so far as this article is concerned, that show a direct relationship to legal crimes which may be classified as rape, incest, sodomy and necrophilia. But it is to be understood that certain other inversions and perversions of the sexual instinct lead to various other crimes. Murder has often been the outcome of sadistic practices.

Not all expressions of homosexuality are to be regarded as evidences of insanity, yet it may be safely said that the majority of sexual perverts are psychopathic individuals.

Sexual perverts of the most disgusting types are found among the psychopaths.

Whether these anomalies of the sexual instinct are always congenital or not has not been settled, and it does seem that inverse and perverse sexual habits may be acquired early in life by the association with vicious and depraved individuals. The sexual perverts are at any rate an exceedingly dangerous and demoralizing class, which should be permanently isolated to prevent their mingling with others.

Sodomy is not an infrequent crime among prisoners. About one per cent. of all admissions to this prison are for this perversion. A most constant and strict supervision is kept over the prisoners by the prison officials to prevent this practice, and in those prisons where more than one inmate is housed in a cell extreme caution must be exercised.

Approximately two per cent. of all admissions to the Indiana State Prison are for incest. But it no doubt occasionally happens that some of the men convicted of incest are innocent, and that blackmail, hysteria and fraud play a part in such convictions.

During the last five years four and eight-tenths per cent. of all the prisoners admitted to this institution were convicted of rape.

The average age of men convicted of rape admitted to the Indiana State Prison is forty-four years plus; ninety per cent. of them showed disorders of the nervous system and an increase or decrease of the tendon reflexes and a general condition of arteriosclerosis; seventy-three per cent. of them were married men in whom the habit of frequent intercourse was established; sixty per cent. of the cases of statutory rape were committed by men over fifty years of age.

Feeblemindedness.

The greatest causative mental factor of crime is feeblemindedness. Several divisions of mental defect have been made, and while they are more or less arbitrary, they are very useful for the purposes of description.

The American Association for the Study of the Feebleminded has formed the following definitions relating to the classes of mental defect:

First. Idiots; mental age below two years.

Second. Imbeciles; mental age from two to seven years.

Third. Morons; whose mental age exceeds that of imbeciles, ranging between seven and twelve years.

Fourth. Subnormal variety; whose mental capacity is slightly above the average custodial case.

All of these varieties are found in the Indiana State Prison with the exception of the idiot class.

As we are only concerned with the symptoms of feeblemindedness that relate to crime, no other symptomatology will be described.

Brutality and cruelty seem to be universal symptoms of imbecility. The precocious cruelty of the feebleminded which enables them to torture animals, cripple birds, to tear the wings and legs off insects, to laugh at the pain of others, to inflict torture with delight, forms the basis when they are physically able for assault and battery, for homicidal attempts and murder.

The easy disintegration or cleavage of consciousness which occurs so often in the feebleminded permits violent explosions of anger against those who interfere with their pleasure. Their wrath is shown by outbursts of fury and frenzied attacks; again it is exhibited by well calculated and cunning cruelty.

The feebleminded, lacking in reason and judgment and devoid of all moral critique, commit all manner of sexual crimes without any feeling of restraint or shame. They masturbate openly and excessively; the imbecile father impregnates his own daughter; he may commit sodomy with his own son; or, the imbeciles may attempt intercourse with their mothers, and "sexual satisfaction with animals is frequently attempted. The great majority of cases of injury (sexual) to animals must be attributed to imbeciles." Many of the attempts to murder, and murder itself, committed by the mentally defective, are perpetrated when the person attacked resisted their erotic assaults.

Often they are cunning thieves; articles of small worth seem to have a great attraction for them; to satisfy their vanity, they often steal wearing apparel. They set fire to property to appease their desire for the excitement which attends conflagrations. Many of the pyromaniacs who are a constant source of worry to the fire insurance companies are febleminded persons.

"Higher imbeciles are predisposed to systematized delusions, and more particularly to communicated insanity. Imbeciles are the near neighbors of paranoiacs, and are apt to pay tribute to them by blindly professing their delusions on the occurrence of the slightest opportunity.

"When a paranoiac is a propagandist of mystical ideas, and reigns as a soverign or high priest, it is the imbeciles who compose his court, and form the majority of his subjects (Jacoby). The contagion is favored by the affinity of tendencies in paranoiacs and imbeciles; every paranoiac is mildly imbecile, and every imbecile is at least a candidate for endemic paranoia if he lives in isolated and fanatical surroundings. * * * In epidemics of religious and political delusion, it is among imbeciles that spies and traitors are most easily found. Their want of critical power, their fickleness of character, and the servility that drives them to become the apostles and slaves of paranoiacs, whose ideas they do not understand, lead them also to surrender when intimidated by warnings, flattery and threats. Their intelligence is equally incapable either of originating a delusion or of spontaneously correcting a delusion; but it is accessible to the positive and negative suggestions of others, and does not appreciate how compromising it is to suddenly abandon a principle.

"In the moral point of view the lacunae are perhaps more marked than in the domain of the intellect, and if these patients are capable of showing to varying extent sentiments and affections of a low order, they are only the least elevated ones, and the lower instincts that dominate them. The majority are vain, gluttonous, cowardly, credulous, idle, irascible, inclined to venereal and alcoholic excesses and to acts of violence (Marce) ; nearly all are given to onanism, and some to unnatural crimes. At certain times they may be seized more or less suddenly with melancholic or maniacal attacks, during which they are particularly liable to commit acts of obscenity, or even arson, robbery, suicide, or homicide. When these attacks, which very often assume in them a periodical or circular character, occur many times, the patients soon fall into a condition of dementia."

Alcohol plays a very important rôle as an element for the production of crime in the feebleminded. It serves to intensify the defect already existing, it weakens the already enfeebled volitional powers; it is influential in firing misguided, wild and erratic emotions. It distorts previously inefficient and irrational judgments. In fact, it raises to the *n*th power all the potential and latent elements for criminality that lie dormant in the constitution of the feebleminded.

Feebleminded Prisoners.

I classed twenty-three per cent. of the crimnals as feebleminded. In the employment of this term I have endeavored to limit its application to those persons who as a group possess "all degrees of mental defect due to arrested or imperfected mental development as a result of which the person so affected is incapable of competing on equal terms with his normal fellows, or of managing himself or his affairs with ordinary prudence." This, in the language of the American Association for the Study of the Feebleminded, is necessary for the diagnosis of feeblemindedness.

Various estimates have been made by different physicians and psychologists as to the number of feebleminded persons in penal and reformatory institutions. This number has varied from twenty to sixty per cent., and these differences can be easily understood when we consider the various natures of the institutions giving this data and the general broadness or narrowness of the psychopathological examination employed in such determinations.

Dr. Walter Fernald has stated "At least twenty-five per cent. of the inmates of our penal institutions are mentally defective and belong either to the feebleminded or to the defective delinquent class.

"At that rate we should have twenty thousand such individuals in adult prisons, and six thousand in juvenile reformatories, making a total of twenty-six thousand defective delinquents in actual custody, not to mention those who have never been arrested and the large number who have been discharged or paroled from institutions and are now at large. There are doubtless as many defective delinquents at large as there are in custody."

The following tables give approximately the percentage of feebleminded persons to be found in the following institutions:

New York State Reformatory, Elmira, about thirty-seven per cent.
New Jersey State Reformatory, Rahway, about thirty-three per cent.
New York Reformatory for Women, Bedford, about thirty-seven per cent.
Massachusetts Industrial School for Girls, Lancaster, about fifty per cent.
Maryland Industrial School for Girls, Baltimore, about sixty per cent.
New Jersey State Home for Girls, Trenton, about thirty-three per cent.
Illinois State School for Boys, St. Charles, about twenty per cent.

At the present time a large part of the estimates made of the number of the feebleminded persons in penal institutions are based upon the results of the application of the Simon-Binet scale of intelligence to the institutional inmates. And for this reason, and various others, these statements are to be regarded conservatively.

No one will deny the value of the Simon-Binet test, for it is of very great value, and one of the best instruments we have for the determination of intelligence, and yet it is not absolutely to be depended upon without first making some qualifications.

This test is in a large degree the measure only of education. It does not give any definite idea of the capacity for achievement. It does not determine the ability of an individual to adapt himself to his environment. It does not take into consideration the mental habits or racial characteristics, and these are very serious objections.

There are many individuals living quiet, simple lives, who accumulate property, who care for their children, who never come in conflict with the law and conventions or society, who are peaceful and law-abiding, self-supporting citizens, never asking assistance from the state. And yet they would be classified as morons and high grade imbeciles by the Simon-Benet system.

On the other hand, there are individuals, many of them educated, even college graduates, who can pass this system with perfect ease, and yet they are absolutely lacking in judgment; childish and puerile in their behavior and relations to others, and "incapable of conducting themselves with any degree of prudence," in business and social relations. They are, in fact, lacking in "mother wit" and are really "educated fools."

A third valid objection is to be counted. Psychologists are springing up all over the country like mushrooms, eager to promiscuously deal out the labels of feeblemindedness to the state's wards without fear or conscience. Many of these same persons have never had more than a few weeks' experience with the insane or feebleminded and are utterly lacking in any knowledge of pathology, and yet they are permitted to give out inaccurate statistics.

What value or what worth can there be in having pedagogic psychologists, unequipped with the knowledge of pathology, to go about saying this and that individual is but six or seven years of age mentally, and thinking "there's an end to it." This is just what is happening every day.

Persons with remedial defects which retard the mental processes are being labeled as hopelessly feebleminded. Imagine the terrible fate if some of our brilliant celebrities had had the cruel misfortune to fall into the hands of this type of psychologists when children.

Every day cases of organic brain diseases, hypothyroidism, cretinism, juvenile paresis, and, in rare instances, psychotic states occurring in febrile diseases are receiving the diagnosis of feeblemindedness from those who are only psychological diagnosticians.

It was my experience to see a prominent psychological authority apply the meaningless term of "confusional insanity" to the delirium of typhoid fever. A few hours later the interne on whose service the patient happened to be, did a Widal test, thereby clearing at once the diagnosis and prognosis in the case.

This instance very well illustrates the need that the average psychologist has for a training in pathology. The psychologist is not the only one at fault, however, the average physician is as poorly equipped in the elements of psychology as the psychologist is in the rudiments of pathology.

It is at once apparent that full value and credence cannot be given to the mental examinations of defectives by persons who are not properly schooled in pathology as well as psychology and with this knowledge supplemented by an institutional training and experience.

It must be borne in mind that a moron, whose chronological age is thirty and whose mental age is nine, does not have, and never did have, the mentality of a normal nine-year-old child.

Even though a thirty-year-old moron measures nine years by the Simon-Binet scale, it must be remembered that he has had twenty-one years of experience and training, and this added factor is an element of confusion.

The question then arises, did this twenty-one years' experience in life enable him to pass the nine-year-old test? If so, the native intelligence has not been accurately tested, and he is not to be classified as of the same mental age as a nine-year old child, who is without experience, but whose mental development has kept pace with his physical growth.

The reports of psychopathic laboratories which operate in conjunction with our courts are not altogether reliable for the reason of the haste in which these examinations have to be given. And second, the states of apprehension, anxiety and fear which often develop in prisoners preceding trials do not offer the best opportunities for accuracy and precision in applying mental tests.

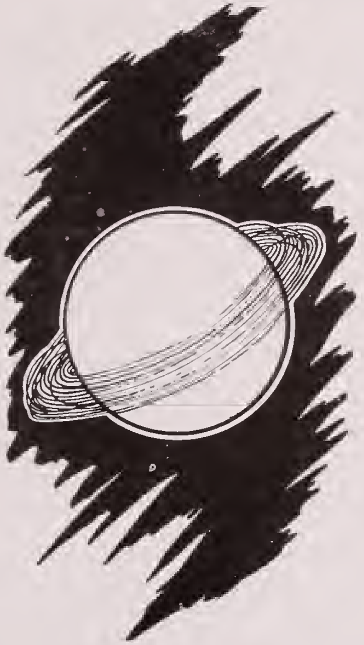
The contents of this paper are but an abridged and synoptical outline of the work that has been done in our laboratory of criminology. We have had no elaborate equipment or extensive material foundation. But we have by careful work gradually accumulated invaluable records which have led and are leading to better classification of prisoners.

"The psychopathic laboratory not only directs thinking, and by classifying, opens the way for the economical training of prisoners; but, by individually adapted teaching, fortifies the man where he is weakest. The drug and alcohol addict is taught how to meet temptation, how to avoid it; the epileptic is assisted in his selection of an occupation. The sex offender is appropriately taught, and the psychopath is shown how to recognize his peculiar weaknesses, and how to train himself to withstand or avoid temptation. These essential, personal, intimate teachings, and many others, can be made available to the needy prisoner only as they are ascertained and given him in the psychopathic clinic."

The prison physician, if he be a medico-psychologist, and he should be, can render a great service to humanity by applying, as Dr. Fernald says, "his skilled energy to the emancipation of individual prisoners from the misconceptions, unworthy ambitions, mental conflicts, incipient psychoses, damaging habits, warped disposition, or inimical prejudice, etc., etc., with which they contend. The relief of individuals from these and many other remedial mental twists is peculiarly the work of the medical man. When others offer to assist in this work their efforts should be welcomed and directed and utilized in this wide and fertile field. The workers are all too few at best."

In conclusion it may be said that a psychopathic laboratory in a penal institution is absolutely necessary. It is just as essential as any other department. It is another milestone in criminological problems.

Indiana State Prison.



KLEPTOMANIA; ITS CAUSES AND TREATMENT.

By

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KLEPTOMANIA, or an irresistible propensity to pilfer, is a true moral disease, a perfect illustration of an ungovernable morbid impulse, and so may be defined as pathological stealing. It argues a state of mind in which the patient is periodically impelled, often against his will, to thieve. Kleptomaniacs purloin on the spur of the moment, without necessity, without a discoverable object except the pleasure of the deed, usually without apprehension of an infraction of the law of right, and without remorse. They act in obedience to an instinct as imperative as that of the common weasel, which has been known literally to dodge the blows of a human assailant in its efforts to fasten on the throat of a fowl. An interesting case of kleptomania is recorded in which the sufferer in possession of an indulgence to pilfer on condition that he returned all stolen articles to their owners, found a satisfactory outlet for his repressed instinct by stealing the watch of the officiating priest at mass and returning it after the sacrament.

A thief steals deliberately, with malice aforethought, driven by necessity or perverted taste, with a knowledge of the value of the articles appropriated and with a definite intent to use them or dispose of them by sale. A kleptomaniac steals in obedience to a blind impulse over which he has no control, or to an insistent voice which hearkens not to the conflicting protest of honest principle or the warning cry of danger to reputation. Property appropriated by kleptomaniacs is usually undisposed of, often thrown or given away, sometimes left exposed to view with no thought of consequences. A young lady whom the writer treated for this mania entered on one occasion the room of a guest at the hotel where she was staying, pocketed the jewelery in sight and appeared at dinner the same evening ablaze in the stolen diamonds, without the slightest conception of the enormity of the act. This girl was amply provided with means to gratify her every wish, and so was not prompted by ordinary motives.

A thief is a criminal; a kleptomaniac is a moral invalid, a sick person helplessly forced to take the belongings of others, and is therefore irresponsible. The distinction is recognized in English courts; but in this country moral insanity is considered sane enough to punish rather than unfortunate enough to treat, and yet kleptomania, especially if encountered in youth, is curable beyond a peradventure.

The cause of this form of insanity is to be sought in atavism, or reversion to ancestral characteristics—the transmission of a predatory instinct from remote forbears, through many intervening generations, to be revived from past centuries, in an inexplicable manner, as an earmark of plundering proclivities that were once normally human, when men reaped their neighbors' crops, when the key kept not the castle, when might was the law of property by land and sea, and cunning and warfare were the way to its possession. Such inbred tendency to larceny is manifested in the present decade to an unbridled degree in the wholesale thefts of the megalomaniac of Potsdam, who, in obedience to an inexpugnable passion for conquest, aims, through the infliction of barbarities beyond the ken of man or devil, to steal the very world.

Kleptomania is distinctly hereditary, as is unscrupulous or purposeless lying, which generally accompanies it. A young patient of the writer's who inherited the mania was the son of a gentleman whose house was full of trifles and ornaments purloined from friends, and whose children by three different wives were all thieves.

Statistics indicate that about seventy-five per cent of kleptomaniacs are women. They will often admit that they are doing wrong, but declare that they can not help it, that at the actual moment of theft they are dazed and are not conscious of what they are doing. Pseudo-maniacs, or pathological liars, make similar explanations.

Kleptomania is occasionally a fugitive expression of lowered nerve tone. There has recently come under my observation an extraordinary instance of pathological shoplifting due to this cause. An estimable young woman, a church member of unblemished character, in consequence of a severe injury to her brain from a heavy window falling on the back of her head, developed in the course of three months serious concussion symptoms which gradually gave place to a condition of profound neurasthenia. While nervously out of balance, this patient observed one day, in a department store at a popular summer resort, a professional shop-lifter purloining a piece of silk underwear, and was immediately seized with an uncontrollable desire to do likewise. Despite an inward warning voice which said to her, "Ruby, you can not do this; you have been brought up differently; what would your dead father and mother say if they saw their spiritually trained daughter a common thief?" she was constrained to listen to another voice that said, "You *must* take it"—ignoring the first that insisted, "You can't"—and appropriate a pair of silk stockings. But forced by an accusing conscience, the next morning she returned to the store and slipped back on the bargain-counter the hose she had taken the previous day; yet, as before, inthralled by the clutch of some mysterious fascination, she was impelled to filch a second time, and these tactics of appropriating and returning articles were repeated daily for several weeks, until the victim of contending impulses, over which she had no control and for which she was in no way accountable, fell into the hands of officers of the law. Her significant first words as she was placed under arrest told the story of her mental anguish, "Oh! I am so glad, for now I shall no longer be forced to break the 8th Command." Medical testimony as to her neurasthenic condition secured her release. This young woman was no more responsible than is a girl for having an hysterical convulsion.

Either consciously or subconsciously, the kleptomaniac recognizes the falsity of her conceptions and struggles against them, but fails to overcome their influence on her feelings and actions. We do not always recognize the pressure of subconscious irresistible impulses that may have driven the unfortunate subject, against the convictions and contentions of a most importunate will, to what the law recognizes as crime, nor dream of the bootless struggles that ended in surrender and heart-break. But the student of criminal psychology, realizing that, whereas crime implies purposed intention to break the moral law, large numbers of the criminal classes are mental defectives, makes allowance for any intellectual feebleness that permits its commission, and adjudges erratic violators of the rights of their fellowmen as proper subjects for psychic treatment rather than for punishment by penalty.

In the case of many young kleptomaniacs, there figures as a cause of their disorder an element of material domination. From childhood the mother has suggested to the daughter, by constantly expressed fears, that she might fall and by endless precautions to prevent such a contingency, the very acts that lure her to destruction. By such an attitude the frail one is brought to believe that she is a hopeless thief. It is taken for granted that she is going to steal at every opportunity, and so a remotely inherited and easily corrected propensity to practice petty theft is developed into a fixed conduct tendency that might find expression in a criminal career.

The rational treatment of this form of insanity involves intelligent home co-operation that abjures distrustful guardianship during an interval when mental suggestions are offered periodically by a medical psychologist to the endormed patient, impelling her to energize to the maximum of her spiritual powers of control in a persistent effort to become normally honest and frank. To this end, integrity is pictured to the sleeper as a moral obligation, hatred of theft engendered, the nature regenerated, and happiness imaged as the natural outcome of living a straightforward life. In the experience of the author, kleptomaniacs are recoverable through such psychic treatment.

EDITORIALS.

Conducted by

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LITERARY FORERUNNERS OF FREUD.

Havelock Ellis* remarks that the conception of psychoanalysis was a brilliant idea for which Freud deserves all credit. It has not, however, been pointed out, so far as Ellis in aware, that Freud had a forerunner in the idea, though not in its clinical and therapeutical applications. In 1857 Dr. J. J. Garth Wilkinson, a noted Swedenborgian mystic and poet of his time, published a volume of mystic doggerel verse written by what he considered "a new method," the method of "Impression." "A theme is chosen or written down," he stated; "as soon as this is done the first impression upon the mind which succeeds the act of writing the title is the beginning of the evolution of that theme, no matter how strange or alien the word or phrase may seem." "The first mental movement, the first word that comes," is "the response to the mind's desire for the unfolding of the subject." It is continued by the same method, and Garth Wilkinson adds, "I have always found it led by an infallible instinct into the subject." The method was, as Garth Wilkinson viewed it, a kind of exalted *laissez faire*, a command to the deepest unconscious instincts to express themselves. Reason and will, he pointed out, are left aside; you trust to "an influx" and the faculties of the mind are "directed to ends they know not of." Garth Wilkinson, it must be clearly understood, although he was a physician, used this method for religious and literary and never for scientific or medical ends; but it is easy to see that essentially it is the method of psychoanalysis applied to oneself, and it is further evidence how much Freud's method is an artist's method.

The procedures of Wilkinson and Freud both are simply egocentric extensions of adolescent introspection which blossoms into the metaphysician's evolutions of his inner consciousness, which has been aptly described as spinning mental cobwebs out of oneself. Naturally it finds expression in many artists and poets, whence the chromatic and drawing eccentricities of many art schools.

Helen Willison Brown has pointed out that the acrid apostle of sweetness and light, Matthew Arnold, has, in his "Buried Self," written about sixty years ago, been almost uncanny in the vivid presentation of psychanalysis. In the Swedenborgian, the effects of Swedenborg's epileptic delusions of memory would play a part. Such delusions of memory would readily rise into consciousness under many forms. Matthew Arnold, aside from certain adolescent stress, was a cardiopath, and much of his buoyancy, irritability, suspicion and mysticism were of this origin.**

John Hunter† recognized both the irritability and dangers from mental states due to heart disease, when he stated his heart trouble placed him at the mercy of any blackguard who chose to force him ino a passion. Given adolescent stress unrallied from, with or without cardiac or pulmonary disease, and all the machinery for the intellectual submarine of psychanalysis results. It is not true that, as Warner Fite†† points out: "To the love of the sensational—for it is too easy to retort a more specific

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**Bookman*, Septembe*r*, 1917.
***Psychanalytic Review*, January, 1917.
†Mental Aspects of Heart Disease. *Alienist & Neurologist.* 1897.
††*Nation*, Vol. CVII, p. 128.

preoccupation—we must also attribute the Freudian exaggeration of sex. To the ordinary view it seems that the desires of the body are many. In the Freudian view they form a prearranged system of which the centre and the end are sex; so that sex is bound to be a ruling obsession under all conditions of life. Hence, if the dream expresses a wish, we must look necessarily for a sexual wish. But here again we may find our answer in the unconscious self-refutations of the Freudians. Brill quotes from Hauptmann, 'Those most fatigued by bonds, dream of freedom'—as if it were not an immemorial commonplace of fiction that we dream, sleeping or waking, of that for which we most intensely hunger."

In adolescence occurs not only the great awakening of sex but with it all other primarily egocentric states, begins then to submit itself to create the associations constituting the secondary ego. The instabilities due to this period, not the sex element, force imperfectly to the background of consciousness the elements which rise into dreams as wish-content, or into waking consciousness as various obsessions.

Numerous forerunners of Freud can be found in what Walt Whitman calls the literature of woe, especially that created by the youth—

"Foredoomed his father's soul to cross
Who pens a stanza when he should engross."

This consciousness, unstable in its fear of and introspection into the unknown, is a frequent feature of adolescence. Freud's tendency to dwell on the conventional egocentric coarse, primitive phase of sex rather than its higher altruistic side, is due to this.

FREUDIAN DREAM TERMINOLOGY.

R. Armstrong-Jones* remarks that a most puzzling dream has resulted from pyschanalytic efforts to analyze dreams. If the dreamer fail to recognize new and strange scenes in which the dream is located, this is owing to its "dramatization." If the characters be unrecognizable, there is "distortion." Should the chief characters occupy a subordinate place there is "displacement." When, as not unfrequently occurs, there is fusion of characters, this is "condensation." When dream ideas become detached from their usual association and transferred to other psychic spheres there is "sublimaton" into other obsessions or delusions. Hysteria is the conversion of a "repressed" idea into motor and sensory discharge. If the idea can be disclosed to the sufferer and thus disregarded, the result is a "cure" obtained by a "cathartic," meaning by suggestion or autohypnosis, or (to use Wm. Brown's term) autognosis. Freudism according to Armstrong-Jones, is dead in Great Britain, thanks to Mercier. If the latter's ideas on "causation" be accepted there is no such thing as the etiologic moment, hence the Freud sex trauma idea is well based, since man becomes a mere response to reflex excitants without central mechanism or control.

SEXUAL INDIFFERENCE.

This results, according to E. J. Kempf,** from either an unappropriate sexual object, or from fatigue of the sexual system through excessive stimulation by an object too constantly present, or when other affective disturbances, such as anger, fear, hunger, jealousy, etc., are present.

Jour. of Mental Science, April, 1917.

***Psycho-Analytic Review*, April, 1917.

When monkeys have lived together for several days erotogenesis does not occur through the presence of the higher receptors (auditory, visual, olfactory) alone, but additional stimulation of cutaneous tactile, labio-tactile receptors, and extensive olfaction is resorted to.

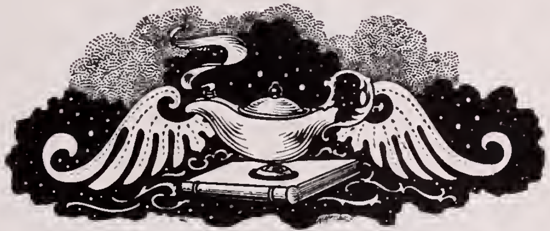
Sexual reinvigoration may promptly result on presentation of a new sex object of adequate type. O. V. Hamilton* finds that when monkeys are sexually aligned they expose their erotogenic receptors to intensive stimulation of an adequate nature before coitus occurs. Yet the sexually indifferent monkey, if allowed a new mate, may rush into coitus with great excitation without previous stimulation, the distance receptors being newly stimulated. This, Kempf remarks, occurs in man as shown in the frequent sex indifference between social and business companions, married couples, or men and their paramours.

No feature of man's constitution has caused so much social turmoil and self-imposed distress as this phylogenetic predisposition of his affective centers. He likes to think of it as an impersonal thing, and calls it the work of the devil; the evil results of the sin of Adam and Eve, impurity, the wickedness of the flesh, and threatens his unruly neurons with hell fire and even castration. Hatred, anxiety, divorce, insanity, suicide, murder and social vice commonly result from this phylogenetic predisposition of erotogenesis. The present sexually obsessed social system cannot be favorable to the biologic welfare of the species. It does not tolerate biologic sincerity in the individual. New insight and more sensible methods of sublimination than persecutory or suppressive methods are necessary if individual health, happiness and efficiency are to be the object of the social system. Insofar as the individual biologic function. relative to the foundation of personality, is concerned, sexual excess as well as excessive sex suppression through subtle fears created by social censorship, disease, etc., blunts the individual acquisitive faculty and social quality.

Whether married or single, the individual should be so trained that he will frankly consider his affective needs and tendencies, and furthermore so trained that these needs and their frank pursuits will conduce to the welfare of society and happiness for him. Here are exhibited the Freudian tendencies to ignore the height of evolution at which man has arrived in the creation of the secondary ego which finds enjoyment in observing the rights of others and conducing to their happiness. Sex, as Maudsley points out, has thus created ethics, the essence of which is altruism.

Biologically, the monkey data obtained are not employed in an etiological manner. Animals in domesticity or in captivity are in an unusual state where the physiological law, that a nerve too frequently excited requires a new excitation to rouse it, operates with peculiar force. Monogamous animals hence notoriously become polygamous in captivity.

Journal of Animal Behavior, Vol. IV.



SELECTIONS.

NEURO-PATHOLOGY.

FURTHER OBSERVATIONS ON EXPERIMENTAL TOXI-INFECTION OF THE CETRAL NERVOUS SYSTEM.—David Orr and Major Rows, *Journ. of Mental Science*, January, 1918, report upon a continuation of their experimental work on the action of bacterial poisons upon the nervous system.

Previously, after several series of experiments, the authors drew attention to the difference between lymphogenous and hematogenous infection. The first was induced by infecting the ascending lymph stream of nerves; the second, by placing celloidin capsules containing a culture of bacteria in the abdominal cavity. Lymphogenous infection was found to be characterized by: (1) Reaction of the cells of the fixed tissues; (2) proliferation of the cells of the adventitial sheath of veins and capillaries; (3) the appearance of scavenger cells to remove disintegrated myelin; (4) nerve-cell degeneration and neuronophage phenomena.

In hematogenous infection they found: (1) the nerve-cells suffered least of all; (2) primary degeneration of the myelin sheath round the cord margin and along the postero-median septum; (3) edema of the cord; (4) dilated vessels and hyaline thrombosis.

In brief, lymphogenous infection produces an inflammatory lesion of the central nervous system, while in the hematogenous variety inflammation is reduced to a minimum, and primary degeneration of the myelin sheath is a prominent feature.

In the previous experiments the results of toxic action were studied in the spinal cord only; in the present series the research has been extended to the brain, and the capsule containing a culture of the *Staphylococcus aureus* was placed in contact with the common carotid artery in the neck. The experiments, though limited in number, have given positive results so far, and help to explain the pathogenesis of certain obscure lesions of the central nervous system found in man. Hyaline thrombosis was found to be a constant result in the cord examined when the capsules were placed in the abdominal cavity, and the same morbid change was found in the vessels of the brain when the capsule is placed against the carotid sheath. The lesions to be described are the direct result of this thrombotic change, and vary in kind with the situation of the local ischaemia and the degree to which the local vascular supply is interfered with.

Rabbits were used for experiment, and two types of lesions were observed, viz., (1) Coagulation necrosis of the nerve cells in the cornu ammonis, in the cerebral cortex, and in the amygdaloid nucleus. (2) Softening in the stratum moleculare of the cornu ammonis.

The cornu ammonis of the rabbit consists in, from without inwards, the alveus, the stratum moleculare, the lamina ganglionaris, which is composed of pyramidal cells, the stratum radiatum, and, most internal of all, the lamina involuta, whose tangential fibres surround folia of the pia-arachnoid invaginated from the mesial surface of the cerebral cortex.

In one case an area of about one-sixth of the circumference of the lamina ganglionaris showed a marked degree of coagulation necrosis of the pyramidal cells.

In frontal sections the cells of the lamina ganglionaris are densely packed together. Normally, each shows a thin cell body prolonged into an apical dendrite, which projects into the stratum radiatum; the nucleus is relatively very large, is clear, round, or slightly oval; it possesses a nucleolus and two or three particles of chromatin. The chromophile material of the cell body is in an amorphous condition; the apical process stains exceedingly faintly, and is perceptible in the stratum radiatum for a short distance only. The area of the ganglionic lamina affected by coagulation necrosis stands out in marked relief owing to the strong affinity for the aniline dye possessed by the degenerated nerve-cells. This area is sharply marked off from, and is appreciably narrower than, the normal portion on either side. Even with a low power the distortion of the altered cells is perceptible, and the sharp definition of the degenerated zone is strongly suggestive of local vascular occlusion. With higher magnification the nerve-cell body and nucleus are seen to be deeply and diffusely stained; both are shrunken and much distorted. The axis-cylinder, which normally is scarcely distinguishable, can be followed into the molecular layer, in which it is seen to give off numerous branches. The apical protoplasmic dendrite is quite prominent, is stained diffusely, at times slightly granular in appearance, and pursues a tortuous course into the stratum radiatum. These alterations are typical of the condition known as coagulation necrosis.

The second type of lesion, ischaemic softening, was met with in one experiment and consists in the softening proper plus the accompanying secondary inflammatory phenomena, the result of the irritative effects of degenerative products on the surrounding tissues, and in the reaction incidental to repair. The softening proper is situated in the stratum moleculare; it just touches the lamina ganglionaris on the one side and the fornix on the other. It consists in layers which can be differentiated into four for purposes of description. The first, in the center, is composed of detritus, amongst which can be seen altered red blood corpuscles, fragments of nuclei deeply stained, and some clear, faintly stained, distorted, oval nuclei. Immediately outside this area is a narrow band of round, deeply stained nuclei, some of which are surrounded by a small quantity of protoplasm. These are loosely arranged and amongst them lie many granular epitheloid cells. The third layer of epitheloid cells or compound granular corpuscles is not sharply marked off from the second of small round cells, and is a dense layers. These epitheloid cells possess a large cell body of varying shape—the result of pressure—which is finely fenestrated, and the nucleus, almost invariably of medium size, is round or oval and clear. A large number of epitheloids show vacuolation, and in only a very small number, the nucleus is of the small, dark, shrunken, and excentrically placed type so characteristic of the scavenger cell in softenings of long standing. Outside the area of scavenger cells the inflammatory phenomena consists in round cells, reaction on the part of the neuroglia, and in proliferation of the adventitial cells of the neighboring vessels.

The small round cells lie free in the tissue and possess a rounded or oval nucleus deeply stained and filled with chromatin. The cytoplasm is finely granular and varies considerable in quantity. In some it forms a very narrow band round the nucleus, in others it is in greater quantity, placed for the most part to one side of the nucleus and is vacuolated. These features are found in the plasma cell in the early phases of its development.

The neuroglia participates actively in the inflammatory reaction, and round the area of softening there is much neuroglial proliferation and hypertrophy. In those cells undergoing active hypertrophy the nucleus is enlarged, round or oval, and clear; the cytoplasm is greatly increased in quantity, is vaguely granular, stains more deeply at its edge, and is prolonged into short, thick processes.

There is a high degree of proliferation of the adventitia of the small vessels in the immediate vicinity of the softening.

In the cerebral cortex there are no gross lesions such as the ischaemic softening in the cornu ammonis, but the nerve cells exhibit varying degrees of coagulation necrosis. A description of this morbid change has been already given in the case of the ganglionic layer of the cornu ammonis. The cortical cells show precisely the same morbid features and staining reactions so characteristic of this type of affection. The coagulation necrosis is not distributed in a uniform manner throughout the cortex in each experiment. Sometimes the upper and lateral regions may contain the degenerate cells, while the mesial, insular, and under surfaces are quite normal or practically so. Again, the morbid change may involve the mesial, upper, lateral, and under surfaces of the cerebrum, thus embracing the pallium and rhinencephalon. When the olfactory lobe shares in the necrotic change its necrosed cells show up very prominently, owing to the sharp contrast between the ganglionic layer and its covering clear molecular lamina.

In the superior and lateral areas of the pallium the morbid change varies in degree from point to point, contiguous territories showing slight variations in intensity; and all the cortical cell laminae are not involved in the necrotic change.

The amygdaloid nucleus, whose cells show as intense a degree of morbidity as in any of the areas already described, appears as an elongated oval beneath the basal ganglia, and its cells show the shrinkage and diffuse staining so characteristic of coagulation necrosis, throwing the entire nucleus into sharp contrast with the surrounding parts.

The areas which show lesions in these experiments are the cortex of the pallium and rhinencephalon, the cornu ammonis, and the amygdaloid nucleus.

The lesions in the brain agree anatomically with what was observed in the spinal cord in an earlier series of experiments on animals when, after the abdominal cavity had been infected by toxins, the myelin was found degenerated round the margin of the cord and on either side of the postero-median septum, while the central portions, including the gray matter, remained intact. If we substitute gray for white matter in the two series of experiments the anatomical distribution of the morbid lesion is essentially similar, *i. e.*, the peripheral portions of the central nervous system subserved by branches from the pial vascular system are affected.

The morphological character of the lesions in the brain points very clearly to the disturbance of the circulation and therefore of nutrition. The cause of the disturbance of the circulation is to be found in the morbid condition of the cerebral vessels, which are dilated, engorged, and show many varieties and degrees of hyaline degeneration of their contents.

Arteries, veins and capillaries are affected, and the thrombotic change, accompanied by dilatation of the perivascular and pericellular spaces due to edema, is found in the vessels of the pia-arachnoid, the gray, and the white matter. All elements of the blood participate in the thrombotic process.

One of the practical applications of these experiments is that they throw light upon the genesis of the infantile cerebropathies, which are now regarded as the result of toxi-infections of medium or even slight intensity, contracted, as a rule, between the fifth and eighth month of foetal life, or more rarely in early infancy. These experiments can be closely correlated, therefore, with what is known at present of the pathogenesis of many forms of mental deficiency.

The precise mechanism of production of these thromboses is still obscure. Whether they are produced directly by the toxins spreading along the vessel sheaths, or more indirectly through a general intoxication, must remain for the present open questions; and as all vascular phenomena are closely connected with the sympathetic mechanism, this must come under examination in future experiments.

Several arguments can be advanced in contradiction of the view that a general intoxication of the blood stream is the sole pathogenetic factor in the causation of thrombotic changes and other lesions described, and the most cogent is to be found in the distribution of the morbid changes, viz., in the cortex of the brain, in the cornu ammonis, and amongst the white fibres round the periphery of the cord and the postero-median septum. There appears to be some significance in the fact that this portion of the vascular system of the brain and spinal cord is, so far as our present knowledge goes, alone connected with the nerves from the sympathetic system. It is accepted that sympathetic nerves—gray fibres—leave the prevertebral ganglia to supply the meningeal vessels; they do not penetrate the nervous tissue, however. This may be the explanation of the peculiar localization of the nerve lesions under discussion; in any case it is a factor worthy of consideration. The presumption would seem to be that disturbance of sympathetic cell function can exert an effect on that portion of the cord whose vessels are under the control of the injured neurons; and it is reasonable to argue that in the experiments where the carotid sheath was infected a similar result in the brain would be obtained, as the carotid vessels are surrounded by a rich sympathetic plexus. As a matter of fact, both series of experiments entirely agree in this, that only the areas within the realm of pial supply show any morbid change of the nerve elements.

Evidence has been gradually converging towards the opinon that there is a much closer interaction between the central nervous system and the sympathetic chain than we have been accustomed to believe. These two systems have been regarded far too much as separate organs, anatomically and physiologically. Recent studies in comparative anatomy, embryology, and research in connection with the ductless glands and their influence upon the entire nervous system, demonstrate clearly that the sympathetic chain of ganglia exerts a powerful, though subconscious, influence upon the higher nerve centers, and, in all probability, assists in controlling the mechanism of nutritive exchange there; while the higher centers, on the other hand, exercise an action upon the lower or vegetative functions subserved by the sympathetic system. There is thus a constant interaction between the two; and hence further study of the symptomatology resulting from disturbance of the nervous mechanism must embrace both symptoms.

NEURO-THERAPY.

GOITRE: USE AND MISUSE OF TREATMENT.—Grimes, *Journal of the Iowa State Medical Society*, November 15, 1917, says that the treatment first thought of, and which the patient is usually given offhand, is iodine internally and externally. Iodine externally is in every case absolutely worthless, yet in spite of the inconvenience and discomfort of the local application of iodine, this measure is still practiced.

Iodine internally, in the form of iodides or iodine, is a favorite treatment. This does good only in a very small per cent. of cases. It does positive harm where the goitre is parenchymatous or cystic. Many cases of simple cystic goitre have been irritated by iodides and passed into the toxic exophthalmic type. In fact, the thyroid condition should be determined before iodine medication for any diseases is instituted.

The X-ray is another form of treatment that has become popular with many physicians. As is well known, the X-ray causes a disintegration and disappearance of parenchymatous tissue. X-ray treatment of the thyroid region is fraught with danger. If the treatment is sufficient to cause a disintegration of the hyperplastic tissue, it is sufficient to cause a destruction of the essential parenchyma, and hypothyroidism results.

Grimes has seen two cases of marked hypothyroidism following the X-ray treatment for simple goitre. It is not sufficient to know in this treatment that the tumor is diminished in size, but we must know whether in five or ten years after such treatment the thyroid function will or will not be permanently impaired.

The essential treatment of this condition is hygienic and expectant, and if after sufficient constitutional improvement and lapse of time the goitre has not subsided, it should be treated surgically. A goitre that does not yield to general measures should be removed for the same reason that we remove a wart or cervical ulceration—to forestall malignant development.

The prognosis in this class of cases is good. Eight per cent. of observed goitres disappear within two to four years without constitutional symptoms. Upon this fact rests the apparent success of goitre specialists, osteopaths, iodine therapy, and other foolish fads. It may be laid down as a fundamental therapeutic fact that when improvement takes place under opposite forms of treatment, the improvement is not due to the treatment.

The next class—that of hyperplastic goitre of exophthalmic type—has received much attention in the past few years, and we are still familiar with the clinical course, the classical symptoms, and the controversy concerning the treatment. We must remember that the exophthalmic type is associated with a nervous instability, that the rest treatment and regulated life is often quite sufficient. We know that a meat-free diet is of benefit; that surgical treatment in selected cases is successful. Just when to operate and when not to operate is an individual problem. Improvement under medical treatment may not take place because of the nature of the case or may fail because the patient's life cannot be regulated. In either event operation must be recommended. Treatment in a way is like that of tuberculosis; more hopeful where the patient's life can be adjusted to the disease.

The prognosis in most cases is good, but we must remember that of all those surgically treated, only two-thirds are successful.

The next class—hyperthyroidism without hyperplasia or where the hyperplastic changes are not evident—of patients deserves a closer study, and this condition should be kept more constantly in mind in making our diagnosis. The clinical picture of the mild case is so like that of incipient tuberculosis that a great many of them are so treated. The patient complains of exhaustion, nervous irritability, flashes of heat, headache, various pains, and chronic invalidism in general. There is an elevation of temperature closely resembling that of tuberculosis; there is loss of weight, asthenia, etc. A diagnosis can be made only after having the patient under close observation for a number of days, when it will be found that the temperature curve is different than in tuberculosis. The patient does not tolerate a meat diet and stimulating medication as the tuberculosis patient does. The improvement under rest is much more marked in the first few days than in tuberculosis.

The treatment is rest, a meat-free diet, and general hygienic measures. Prognosis depends upon conditions of life and the persistence of treatment; frequent child-bearing works against recovery.—*The Therapeutic Gazette.*

PSYCHIATRY.

Mutism in the Soldier and Its Treatment.—Colin McDowall, *Journ. of Mental Science*, January, 1918, says many cases of complete loss of speech are met with in men enlisted in the present war and these may be divided conveniently into three main categories as follows; mutism arising in the field, in hospital, and previous to participation in active service.

Loss of speech occurring in the field is nearly always due to close proximity to the explosion of a shell or mine. The man is frequently blown into the air or knocked over and buried, but this is not always the case.

Men have described how one shell after another fell near them in rapid succession, and though not close enough to inflict any physical injury, yet the mental effect was so great as to produce a state of complete helplessness and subsequent loss of voice through fear. The men can tell when a shell is near them by the sound produced as it travels through the air, and some have described the sensation of being blown up by a shell explosion. One patient, a warrant officer, said that he felt as if he was being distended with air. Many can give no details of any kind. It appears that the main effect of shell explosions in one's immediate neighborhood is to produce a highly emotional state.

It is not easy to prove how great a part emotion plays in the production of mutism in those cases in which a man is violently thrown into the air or is knocked over by concussion. The actual explosion lasts only a minute fraction of a second, but the mental effects, if the victim retains his consciousness, must be intense. That he has no recollection of the explosion in no way disproves that he was momentarily conscious of it. On admission these subjects of mutism exhibit many signs of extreme emotion due to terror—tremor often generalized, rapid breathing, marked corrugations of the forehead, and a restless, shifty manner. There is another type of case in which dullness, apathy and depression are the leading features, and this type is most frequently observed when deafness is a superadded symptom.

Mutism, as seen in soldiers, is due to various causes, but all of an emotional character, and once a condition of speechlessness has been produced this state is prolonged by the inability of the man to overcome an inhibition, and thus regain the control of a voluntary mechanism which he does not understand. In most instances, ignorance, and in many, indifference, prolongs the trouble.

The symptoms accompanying mutism are not invariable, but the point of most importance is the condition of the respiratory apparatus. Frequently a case cannot hold his breath for more than twelve or fifteen seconds; respirations are rapid and shallow; he is unable to take a deep breath, and cannot blow out a match a yard away; the volume of breath on powerful exertion is only poor. Such is the condition in a typical case, and it does not appear to matter how long he has been ill, as cases of six or even seven months' duration have exhibited the same respiratory sign; however, if a man is on the point of recovery his respiratory troubles are by no means so marked, and in the cases of home troopers, and, in all cases in which emotion could not be assigned as a causal factor, the respiratory disturbances are not present. Other occasional accompaniments of mutism are inability to cough, whistle, and put out the tongue—the latter a suspicious indication of a not straightforward case. Some patients are unable to arrange the lips correctly for the production of certain sounds, and the tongue does not strike the teeth when an attempt is made to produce dentals. On recovery, all have a certain amount of hesitation in their speech, and absence of this impediment must be considered a suspicious sign. The recurrence of mutism after several weeks and even months is quite common, and here, again, the emotional character of the cause is very evident.

The author reports a number of cases, some accompanied with deafness, which illustrate the various causes, some following trivial events, occasionally, apparently not of a strictly emotional nature, as following a "boil on the face," due largely if not entirely by suggestion, and some were possibly cases of malingering, since the opportunity and incentive are ample. A case may be genuine at the beginning, then suddenly discover that he can speak, but maintain his former silence; or he may simulate dumbness from the beginning. Deafness may also be simulated, but the task is more difficult though not impossible. A much commoner form of shamming is aphonia.

It is difficult to give satisfactory explanation of mutism and deafness. Deafness corresponds to functional anesthesia. It seems to be produced by a mental stimulus sufficiently powerful to deaden the central area for the reception of sounds. Functional deafness may engraft itself on a passing organic condition. Labyrinthine concussion is a recognized condition. Functional deafness is somewhat analogous to the state of amnesia frequently met with in soldiers returning from overseas; in two instances the amnesia persisted after the deafness was cured; doubtless cases seen at an earlier stage would show an alliance of the two conditions more clearly and more frequently. The loss of memory is an unconscious effort to blot out the horrors of the patient's past experience. Probably in much the same way, deafness is a successful but involuntary means to shut out the present. Then ignorance, lack of self-confidence and initiative maintain the disability.

The forms of treatment of mutism are endless; the author's usual method is briefly described as follows: The patient is asked to take a long breath. He is then told to hold his breath; he fails, but very frequently persists that he succeeded. I then give him a cigarette which he is asked to inhale, when the patient at once discovers that he is incapable of holding his breath. He learns, possibly for the first time, that his respiratory apparatus is at fault. Exercises to promote correct breathing are then undertaken. The most important point is to obtain a good volume of breath without hesitation or expiration. He is asked to blow out a match at increasing distances; then to breathe freely, trying to say "Ah!" at the same time; then to sigh the sound "ow," and later the sound "ou." Three long breaths and three sighs, together with the correct mouth formation, produce the sentence "How are you?" Once deep breathing is established, a sudden squeeze of the abdominal wall will produce phonation. The immediate effect will be a display of emotion. Tears are frequently the precurser of speech. As soon as a man can whisper faintly but sufficiently for others to hear I bring in another patient or a nurse to show the patient that he can now be understood. The following day the same process is repeated, and as a rule the man will talk freely after the third day.

Deafness is also dealt with on simple, common-sense lines. The patient is seated on a chair and holds a small mirror in his hand. I stand behind the man and instruct him to look at my eyes reflected in the mirror. After a suitable interview a sudden noise is made without any movement on my part. The patient will blink and the mirror will render him conscious that he has moved his eyelids. He is also conscious that the movement is a proof that he can hear. The whole performance is simplicity itself, and it appeals to the man's common sense and he is convinced against his inclination in some cases.

In both these simple methods the principal agents are common sense and re-education. Lip-reading and the deaf and dumb alphabet should never be allowed.

EMOTIONAL HYSTERIA.—Dr. Filippo D'Onghia, *L'Isterismo Emotivo*, *Annali di Nevrologia*, *Anno xxxiv*, *fasc. 3*, draws attention to the fact that Neri did not meet with any of the ordinary phenomena of hysteria among the 2,000 survivors of the earthquake at Messina whom he examined.

Very often, he remarks, hysterical manifestations are caused by trifling emotions and even every-day annoyances. The lady, who will fall into convulsions on account of some miserable quarrel with her husband, will very likely the next day, when something really tragic occurs in her life, find all the energy that the situation requires, and will put aside her hysteria.

An earthquake occurs unexpectedly. Frequently it arouses an individual from his sleep, and permits only of one thought, that of saving himself. Nothing artificial can prevent the accomplishment of this one aspiration. It is not possible that the nervous energy, which is absolutely necessary to the organism at that supreme moment of peril, can remain useless in a paralyzed limb which prevents the individual from saving himself, or in a tongue dumb and silent, which prevents him from crying aloud for assistance. "It is not possible, above all, that another personality, an inferior and encumbering personality, should substitute itself for, or overcome the first and true (personality) and subdue it."

"War, on the other hand, and especially the war of to-day, is such that the nervous resistance of the individual is put to a very hard proof.

"During the long hours in the trenches, with limbs cramped by the uncomfortable position and suffering from excessive cold or excessive heat, when the surrounding silence is only broken by the distant roar of cannon and the nearer rattle of musketry, by the groaning of the projectiles of the former and the whistling of the bullets of the latter, and finally, by the moans of a comrade, who, while moving to satisfy some need, has been wounded to death by some invisible enemy sharp-shooter, that is the time and the manner in which the nervous tendencies of an individual acquire consistency and color. And when, at an ill-omened moment, the cannon thunders louder, and the roaring is followed by a howling that shakes and overturns everything, what marvel that this latent tendency, this potential neurosis, I might say, is translated into an actual neurosis?"

"Here, also, the danger is imminent, and no one, unless he be in the fullness of health and strength, can sustain it; but, contrary to what happens in an earthquake, the neurosis itself may be the means of the salvation of the individual, by bringing about his removal to the rear."

"The idea, I know, is neither new nor strange; but meanwhile it seems to me that it may be the fundamental point of the question, that it creates a true psychological contrast between the survivor from an earthquake and the soldier in a war. It is the pathogenesis itself of hysteria which offers us the explanation of the phenomenon."

"Each one of us possesses two personalities which in normal conditions, co-operate harmoniously in our conservation and in our well-being—consciousness and subconsciousness. In hysteria the second sometimes usurps authority over the first, and causes the well-known morbid manifestations, which may succeed in encumbering the life of the patient. But when the actual existence of the patient is menaced, the two personalities recover themselves and unite their energies in common defence. We all know that hysterical symptoms, previously rebellious to every form of treatment, disappear in the moment of peril; the paralytic recovers the movement of his limbs, the dumb regains his speech, the blind his sight, etc."

"But if these morbid manifestations, which previously constituted an obstacle to the free activity of the patient, can become, in some contingency, useful and beneficial to him, the subconsciousness does not hesitate to reproduce them, feigning, I might almost say, for its own sake, a set of morbid symptoms, which may be the only means of saving the individual by removing him from the place of peril."

"Then the conclusion to which we must come, will be, I believe, rather different from that at which Babinski and Dagnan-Bouveret have arrived; that is to say, it is not so much the intensity or the quality of the emotion which determines the appearance of the symptoms of hysteria as the conditions in which the emotion is produced, and the utility, more or less, which the individual may derive from the neurosis which his subconsciousness charges itself with placing on the scene."

The paper is illustrated with reports of a few cases in which hysterical symptoms manifested themselves among wounded soldiers. Dr. D'Onghia explains the paucity of the cases because, being attached to a field hospital, few such came under his care, as patients suffering from nervous and mental diseases are removed as soon as possible to hospitals in the second line.—*The Journ. of Mental Science.*

APHASIA IN RELATION TO MENTAL DISEASE.—R. Percy Smith, in the *Journ. of Mental Science*, January, 1918, Vol. LXIV, p. 1, writes that the alienist may be called in consultation for the following reasons in cases where there is aphasia: (1) Because of the confused or incomprehensible speech of the patient and other conduct suggesting confusion or disorder of mind; (2) because of definite signs of mental disorder predominating over the aphasic speech trouble; (3) to decide on the proper care and treatment of patients in whom aphasia of various degrees of severity is associated with disorder of mind and conduct; (4) to assist in forming a prognosis as to mental recovery or otherwise, or in the diagnosis from other organic conditions, such as general paralysis; (5) to give an opinion as to the business or testimentary capacity of a patient suffering from aphasia, or occasionally to assist in the solution of the question of responsibility of an aphasic in criminal cases; (6) to give an opinon to a patient with manifest aphasia as to why there is difficulty in writing letters, and in getting "command of words," and in regard to the outlook for the future.

This study is based upon some forty-five cases of varying degrees of severity of aphasia and mental disorder which were divisible mainly into four groups, viz.:

(1) Those in which dementia, or mental disorder or failure sometimes amounting to certifiable insanity, preceded the more definite and classical affection of speech designated as aphasia.

(2) Those in which considerable mental failure was concurrent with or subsequent to an attack of aphasia. In severe and fatal cases the extreme mental dissolution of coma is seen.

(3) A third group in which, although there is severe affection of speech, the patient possesses such a degree of mental capacity as to permit of business or testamentary capacity.

(4) Cases in which there is some slight hampering of speech with very little mental disorder, although some may be present.

The author discusses these seriatim, illustrating each group by reports of cases.

With regard to the first group it will be manifest that a patient who has already become disordered in mind is likely to have his mental capacity further deteriorated by the additional weight of an attack of aphasia, though this result does not always follow.

The *second* group of cases, viz., those in which considerable mental failure is concurrent with or consequent on an attack of aphasia—contains many examples of the different ways in which aphasia may manifest itself.

The *third* group comprises those in which, in spite of severe affection of speech, the patient possesses internal language and such a degree of mental capacity as to permit of business of testamentary capacity. In testamentary cases the same general rules apply as in cases where there is no aphasia—namely, that the testator "shall understand the nature of the act and its effects; shall understand the extent of the property of which he is disposing; shall be able to comprehend and appreciate the claims to which he sought to give effect; and, with a view to the latter object, that no disorder of the mind shall poison his affections, pervert his sense of right, or prevent the exercise of his natural faculties, that no insane delusions shall influence his will in disposing of his property, and bring about a disposal of it, which, if the mind had been sound should not have been made."

The author quotes Hughlings Jackson, who said: "Such a question as 'Can an aphasic make a will?' cannot be answered any more than the question, 'Will a piece of string reach across the room?' can be answered. The question should be: 'Can this or that aphasic person make a will?' "

Every case must be considered upon its merits after the most careful examination.

VENEREAL DISEASES; THEIR RELATIONS TO INSANITY AND NERVOUS DISEASES.—John Joseph Kindred, *New York Med. Record*, 1918, Vol. XCIII, p. 184, writes that syphilis was the cause of 18 per cent. of all the insanity in men and about 13 per cent. in women, in 5,700 first admissions, the total number of admissions of insane cases to the New York State Hospitals for the insane within a recent year. In other words, of 5,700 insane men and women admitted during the year, 18 per cent. were men suffering with paresis caused by or associated with syphilis, and about 13 per cent. were women paretics or parasyphilitics, whose condition was due to or closely associated with syphilis. Notwithstanding this significant showing as to syphilis in its etiologic relations to insanity, only about 5 per cent. of all syphilitics develop outright insanity. This would seem to prove that the cerebrospinal system in this 5 per cent. is peculiarly susceptible to the syphilitic poison, particularly in those who have not been given to alcoholic and sexual excesses and undue mental worry and anxiety. In most cases of paresis, however, we have both susceptibility and a history of excesses. The fact that such a small percentage of syphilitics develop insanity, when we consider the mischievous effect of syphilis on so many of the bodily organs and tissues, leads us to the conclusion that syphilis after all, in many cases, may be considered to this extent a somewhat benign disease, especially if thoroughly and systematically treated from its incipiency by modern methods. While some of the roseate hopes for uniformly successful results of the salvarsan and neosalvarsan methods and other modern methods of treatment of tertiary syphilis, unfortunately, have been shattered, yet it can be conservatively claimed and proved that the modern treatment of tertiary, brain, and spinal syphilis has in many cases been positively brilliant.—*American Journ. of Syphilis.*

Does a Paretic Gold-Sol Curve in Psychiatric Cases Always Indicate Syphilis of the Nervous System?—Paul G. Weston *American Journ. of insanity*, 1918, Vol. LXXIV, page 431, reports that in the course of fifteen hundred routine examinations of spinal fluid (Wassermann reaction, globulin tests, cell count and gold-sol reaction) it was found that the fluid from three patients, who had no history of syphilis and no positive Wassermann reactions and two negative luetin tests, caused a precipitate of colloidal gold in the paretic zone. These three cases were chosen because there was no history of syphilis—and it is admitted that with the insane in particular, the absence of a history of infection is of little value—and no laboratory evidence of syphilis other than the gold reaction. The author does not consider an increase of globulin or the presence of twenty or thirty cells, when taken alone, to be indicative of syphilis. He has repeatedly found an increase of the globulin in the fluids from patients who were not syphilitic. The question of whether the paretic curve ever occurs in psychiatric cases, not syphilitic, is left open.—*American Journ. of Syphilis.*

CLINICAL NEUROLOGY

Emotive Psychoneuroses: Two Cases.—M. de Fleury, *Bulletin de l'Academie de Medecine*, Paris, February 26, 1918, 79, No. 8, agrees with Dupré that besides neurasthenia and hysteria, we must accept a third group of psychoneuroses, the emotive type, a constitutional or acquired *émotivité.* They have been classed hitherto mostly as traumatic neuroses, but the traumatism merely reveals or aggravates the constitutional instability. The train of symptoms from loss of balance in the circulatory, respiratory or digestive system, the tremor, the disturbance in the rhythm of the heart beat, the exaggeration of the reflexes—all this represents an enormous total of automatic neuromuscular activity which has nothing in common with the clinical exhaustion of neurasthenia. The spasmodic constriction of the muscles of the neck, and local spasms elsewhere distinguish the emotive psychoneuroses from hysteria. These two conditions are not only distinct but are separated by a deep chasm, the chasm which parts honest veracity from a morbid tendency to falsehood. With the emotive psychoneurosis the subject is ashamed of his symptoms and seeks to conceal them, while with hysteria, the subject seeks to display them theatrically, and the symptoms vanish when there are no longer any witnesses. This conception of the hyperemotive constitution clears up at once the puzzling field of psychoneuroses. They all fall naturally into the three classes: neurasthenia, hysteria and the emotive constitution, sincerity being an attribute of the latter in distinction from hysteria.—*Jour. A. M. A.*

Early Symptoms in Locomotor Ataxia.—Edward Livingston Hunt, *The Medical Council*, 1918, Vol. XXIII, p. 115, states there are five leading symptoms in particular with which locomotor ataxia inaugurates its attack on the nervous system. These are: (1) Pain. (2) Paraesthesiae. (3) Bladder symptoms. (4) Blindness. (5) Gastric disturbances.

The most common and usual way in which the disease begins is with the appearance of pains. These pains are invariably described as sharp and shooting in character, short in duration, and in distribution particularly limited to the legs and thighs. They occur in paroxysms and last but a few seconds.

The second early symptom with which the disease begins is that known as paraesthesiae. These paraesthesiae are exceedingly common and occur in fully seven-eighths of the cases. Their distribution is very much like that of the pains; thy almost invariably begin on the inner side of the thighs and extend down the leg to the feet. Later on in the disease, as the condition progresses, they involve the upper part of the body and include the arms and hands.

Disturbances in the action of the bladder are a very common manner for the disease to begin. In many spinal affections it is the first symptom and in locomotor ataxia is especially common. The mechanism of the bladder is poorly understood, and therefore it is difficult to explain the reasons for the various kinds of bladder disturbances which arise in spinal cord conditions. The most common ways in which bladder disturbances manifest themselves in locomotor ataxia are twofold: either there is marked difficulty in emptying the bladder, or there is great difficulty in starting the stream.

Blindness is much less frequent as an initial symptom than either pain or bladder disturbances. It does not occur in more than 5 per cent. of the cases. It very often does present itself in the very beginning of the disease. The pathology is that of a primary optic nerve atrophy.

Another method of onset in locomotor ataxia is by the development of symptoms referable to the stomach. This is present in about 10 per cent. of the cases, being more frequent than eye symptoms, but not so common as bladder symptoms. The method of onset is threefold, pain, simple vomiting, or gastric crises.—*American Jour. of Syphilis.*

DIFFERENTIAL DIAGNOSIS OF NEUROSES.—O. Nageli, *Correspondenzblatt für Schweizer Aerzte*, Basel, February 9, 1918, 48, No. 6, remarks that nowadays the most important thing in the field of internal medicine is a good knowledge of the neuroses, and in nothing else are there so many blunders made in diagnosis and treatment. Symptoms are ascribed to hysteria or to neurasthenia and a grave organic lesion is overlooked, or, even more frequently than this, grave organic disease is assumed when the symptoms are merely of a functional nature. In study of the neuroses, the neurologic findings must be disregarded and the psychic condition determined as the basis for diagnosis and treatment. The more numerous and diverse the complaints of subjective symptoms, the more probable the assumption of a neurosis, and in all cases the early recognition of the neurosis and the return to work are greatly to the true advantage of the patient. He cites figures to the effect that five-sixths of the cases of sciatica at Baden spas in 1917 proved to be merely neuroses, and three-fourths of the cases of supposed heart disease at Nauheim, and in these cases the spa treatment is of no benefit. Năgeli's own experience further confirms that in a large proportion of cases of rheumatism the trouble is merely a neurosis. Physicians shrink from telling the patient that his trouble is merely a neurosis. Only the combination at the same time of dilatation, hypertrophy, murmurs and possibly changes in the pulse exclude a cardiac neurosis, as a rule, and even this combination only when it fits into the frame of a given valvular disease.—*Jour. A. M. A.*

A CASE OF PARAMYOCLONUS MULTIPLEX.—Dr. Gilliland, *Jour. Mo. State Med. Soc.*, March, 1918, reports a case because of the presence of peculiar muscular contractions seen particularly in the thighs. The contractions are fibrillary in character; small muscle bundles varying in thickness from one-half to 2 or 3 cm. and in length from 3 or 4 to 10 or 12 cm. are seen to contract irregularly. They are clonic in type.

This phenomenon is seen principally on the anterior surface of the thighs, but also to a lesser degree on the posterior surface of the thighs; in the legs, abdomen, back and arms. The contractions are present during sleep, but it was not determined whether they are as great. The patient thinks there has been some decrease in the strength and frequency of the contractions while he has been in the hospital.

The history of the present illness is as follows: Four or five months ago patient first noticed weakness in the right foot; then weakness of the right leg and thigh; then the left foot and whole extremity. No change of sensation was noticed. About the time of onset of the weakness, there was noticed contractions of small portions of the muscles in the calves and soon after in the thighs. The contractions increased in severity until several weeks ago; since that time the strength has remained constant. There has been no soreness of the muscles at any time.

Twenty-eight years ago the patient had a sunstroke; since that time he has frequently had severe muscle cramps following hard work or work in the hot sun. He says the present cramps are different from the cramps due to work in the following respects: Cramps from work involved larger muscle bundles, and muscle soreness followed the cramps. The present cramps are slightly painful, but no soreness is noticed later. The patient thinks he has had no cramps from work for six months.

On entering the hospital the patient complained of weakness and cramps of the legs. His past history shows typhoid and malaria twenty-eight years ago; sunstroke about the same time; venereal disease negative; alcoholic beverages to moderation years ago, but none for the past fifteen years. His family history is negative; has six children living and well.

Physical examination shows patient of 66 years; heart 13 cm. to the left, otherwise negative; some muscular atrophy, but it is a question whether more than is to be expected in a man of his age; paralysis of the extensor muscles of the toes of the right foot; reflexes practically normal; marked general arteriosclerosis.

The following are to be considered in the diagnosis of this case: Paramyoclonus multiplex of Friedreich; arteriosclerosis affecting the anterior portion of the spinal cord and particularly the thoracic and lumbar regions, muscle phenomena resulting from the general arteriosclerosis with ischemia of the muscles.

EPILEPSY AND THE DUCTLESS GLANDS.—Guy P. U. Prior and S. Evan Jones, *Journ. of Mental Science*, January, 1918, present an elaborate study of the subject, in which they not only consider the relation of the ductless glands to the causation of epilepsy, but also, by means of charts, make a most exhaustive study of the complex subject of the co-reciprocal and antagonistic action of these glands, one upon the others, as well as the effects of each gland upon the various organs and tissues of the body, from which they formulate the following conclusions:

Among statements and results which are apparently absolutely contradictory and opposed, is it possible to co-relate these more than confusioned actions?

We have seen that epileptiform convulsions, according to various authorities, may occur with apituitary, hypo- and hyper-thyroid, hypo- and hyper-suprarenal and aparathyroid conditions. All these glands play an important part in the calcium metabolism. In apituitary, hyperthyroid, hyposuprarenal, and aparathyroid affections, there is an increased loss of calcium from the tissues. If this salt has the influence that we think in the causation of epilepsy, this may be found to be the common ground upon which all these glands act. In over-action of the suprarenals there is a calcium retention, which makes it difficult to explain how an over- and under-action of this gland can both cause convulsions. If an over-action of the suprarenals should be a factor in the causation of the phenomena it may be through these glands that the thyroid, pituitary, and parathyroid act, as thyroid secretion stimulates the suprarenals to action. and the cortex of the suprarenals hypertrophies in apituitarism, and there is an ill-understood relationship between the parathyroids and the suprarenals. The subject is full of difficulties, and probably not at present capable of explanation. That the ductless glands have some part in the production of epilepsy, and that their extracts may be beneficial in this disease, we think is proved. But, except in cases of apituitarism and marked cases of aparathyroidism, it is not possible to give definite indications as to which gland will be useful in any given case. One can only be led by general glandular symptomatology.

THE COMPARATIVE VALUE OF THE WASSERMANN, THE COLLOIDAL GOLD AND OTHER SPINAL FLUID TESTS: A STUDY OF 203 CASES.—E. M. Hammes, *Am. J. M. Sc.*, 1917, CLIV, 625, presents the following summary: 1. The most constant finding in a pathological spinal fluid is a positive globulin. It is indicative of an inflammatory process, but it is of no specific import.

2. Pathological cerebrospinal fluids usually show some lymphocytosis. However, the number may be normal. Fluids from cases of meningitis almost invariably give a high cell count.

3. As an index of pathological change in the cerebrospinal fluid the colloidal gold reaction is more delicate than any other test here employed.

4. Normal spinal fluid usually causes no reduction of the colloidal gold. A slight reduction in any of the dilutions is of no diagnostic import, and may occur in normal spinal fluids.

5. Cases of tabes and cerebrospinal lues gives a typical colloidal gold curve in the luetic zone. Although in tabes the intensity of the curve is usually greater, it is not sufficiently constant to be of diagnostic value between the two conditions.

6. In paresis the colloidal gold test is sufficiently frequent and characteristic to warrant the term "paretic curve" and is of great diagnostic value. However, it has been observed in cases of tabes, cerebrospinal lues, multiple sclerosis, brain abscesses, and once in puerperal eclampsia.

7. In meningitis the colloidal gold curve usually occurs in the higher dilutions, and is probably of value in the diagnosis of doubtful cases.

8. In spinal fluids with normal findings, except a paretic colloidal gold curve in doubtful cases, the possibility of a multiple sclerosis must be strongly considered.

9. The colloidal gold test is more delicate than the Wassermann test. Spinal fluids from luetics have given a colloidal gold luetic curve with a negative Wassermann. However, we have never observed a normal colloidal gold curve with a positive Wassermann in the spinal fluid. Exceptions to this are the congenital luetics.

10. Under antiluetic treatment there is usually a reduction in the cell count and globulin of the spinal fluid; frequently the Wassermann becomes negative; rarely is there a change in the colloidal gold test.

11. No spinal fluid test (except the presence of bacteria) is specific. Every test is simply that much co-operative evidence and should be combined with the history of the case and the clinical findings.—*Cleveland Medical Journal.*

A SPINAL CORD TUMOR.—J. W. Bergstrom, *Jour. Mo. State Med. Society*, February, 1918, reports the case of Mrs. H., white, female, aged 35 years. Admitted into hospital October 21, 1917. Complaint: numbness of legs and dragging of feet. Family history and past history unimportant. Present illness dates back to April, 1914. There was an ascending numbness in the left leg, accompanied by partial paralysis. Complete paralysis of leg developed three months later. Condition improved for a time, but in November, 1916, complete paralysis again developed in left leg. In January, 1917, right leg became involved. There were tingling sensations and pain at night. Paralysis began in March, 1917, and rapidly progressed. During the past three years patient has had difficulty in starting her urine and also impaired control of anal sphincter.

Important findings in the physical examination are: 1. Spasticity of both legs; bilateral patella clonus; ankle clonus; Babinski, and increased knee kicks. 2. Diminished sensibility to light touch over whole body below axillae, also over median aspect of both arms above wrist; anesthesia to pin prick over median side of both arms and left half of body below axilla; hypalgesia below axilla over right chest and abdomen; inability to differentiate heat and cold over left half of body below axilla and over median aspect of both arms above wrists. 3. Roentgen ray, negative.

Laminectomy performed October 31, 1917, and small fibroid tumor was removed from left side of posterior aspect of cord, under fourth cervical vertebra. Reflexes were markedly diminished after patient came out of anesthesia.

November 2, patient was able to move right leg and foot, also toes of left foot. November 11, power of right foot practically normal; reflexes normal except for Babinski; left leg has little power of flexion at hip; power in foot good; definite patellar and slight ankle clonus. Sensory examination shows an area of anesthesia to pin prick and inability to differentiate heat and cold over right leg and right side of body below axilla in front and lower dorsal vertebra behind. In front this area extends a short distance beyond midline to left. November 12, patient walked a short distance with assistance. November 13, patient took a few steps unassisted.

PSYCHOGENOUS INJURIES OF THE EYES IN WAR.—Oloff (*Ophthalmische Gesellschaft in Heidelberg*, July 31 and August 1, 1916; Abst. in Archives of Ophthalmology, 1918, XLVII, 116) writes that the term psychogenous injury embraces hysteria, neurasthenia and traumatic neurosis. In the present war, the principal part in the induction of these conditions is played by drum fire, explosion of bombs, and other severe explosions that have not inflicted any physical trauma. There have been observed but few such injuries of the eyes, and the cases previously described were all local phenomena of a general hysteria with the common hysterical symptoms, outside of the eyes. Oloff reports two cases, in both of which the cause was great psychical high tension, due in one to the explosion of a bomb in a trench. In both these cases the typical hysterical symptoms were confined to the eyes and showed themselves in the form of spasms of the ocular muscles. Other hysterical symptoms outside the eyes were entirely absent. These cases confirm the neurological observation already made in this war, that occasionally healthy persons who have no hereditary taint may become hysterical in consequence of great mental exhaustion and shock, due wholly to the weight of the catastrophic occurrences of the war, and that hysteria may run a monosymptomatic course. The prognosis of psychogenous battle injuries of the eyes corresponds in general to that of war hysteria, and must be considered less favorable as regards the final result. It is recommended that such patients should not be returned to the front, but that they should be discharged as unfit for service. They are perfectly competent to perform their civilian duties.—*Cleveland Med. Jour.*

A NOTE ON MENTAL PECULIARITIES AS SYMPTOMS IN STUTTERING.—Walter B. Swift and Jennie Hendrick, in the *Journal of Applied Psychology*, Vol. II, March, 1918, No. 1, conclude that stuttering forces the patient to do or perform numerous peculiar things which are wanting in normal people. These can properly be classed as symptoms of stuttering; they are surely performances that find their origin in the malady. Then, too, they disappear from the life as soon as the trouble vanishes.

A CASE OF HYPOPITUITARISM.—Dr. Sachs, *Journ. Mo. State Med. Soc.*, April, 1918, reports a case of a peculiar form of hypopituitarism. He has the neighborhood symptoms of characteristic temporal blindness in the left eye with complete loss of vision on the right side. There is a certain degree of hydrocephalus but instead of being fat, as most hypopituitary cases are, he is very thin. There is a history of polyuria, but we have not been able to demonstrate this while he has been in the hospital. He has never had any sugar in his urine. His genitals are perhaps a little smaller than normal but not definitely atrophic. He shows an extreme degree of convolutional atrophy in the Roentgen ray plate and also shows a large sella turcica with a bony tumor which is apparently growing up into the brain. He has had consistently subnormal temperature, which corresponds to what may be properly called the hibernating type of pituitary disease. This case corresponds very closely to the so-called Lorraine type of hypopituitarism.

BOOK REVIEWS.

DEMENTIA PRAECOX STUDIES.—A Journal of Psychiatry of Adolescence, January 1, 1918, published quarterly under the auspices of the Society for the Promotion of the Study of Dementia Praecox; Bayard Holmes, M. D., Editor and Publisher, 30 North Michigan Avenue, Chicago, Illinois. $5.00 per year.

The following, from the prospectus, will convey to the reader the author's motive for launching this new publication:

"With the advancement of scientific knowledge, the need of specialization arises. Coincident with the growth of special departments of knowledge there arises the further need of a medium of expression. Of the many important functions of the journals, there is none more pre-eminent than the knitting together of a group interest, which promotes and stimulates co-ordinated attack upon scientific problems.

"In psychopathic medicine which, until recent years, has had no special procedure of its own, advance has come only indirectly by reflection from other related fields. Surgery, neurology, physiology, bacteriology and psychology have each contributed something to the knowledge of mental disease. Important as these gifts are, no department of medicine can justify its right to exist unless it attempts to solve its own problems. At the present time two radically different conceptions of the mode of origin of mental diseases are held by students of these disturbances. By one group of authors the attempt is made to interpret all psychopathic behavior from the standpoint of subconscious complexes. The psychogenic hypothesis has been developed with great vigor and ingenuity and in response to the need for a medium for the expression of this interest several journals have been published. There exists, on the other hand, a group of scientists who hold to the hypothesis that disease of the mind is a result of organic disease of the body. The editors of this journal hold to this faith. They feel further that many considerations urge the publication of a journal devoted exclusively to the study from the organic point of view, of one part of the field of mental disease, viz., dementia praecox.

"Although the name dementia praecox is an unfortunate one, it is, nevertheless, the appellation of a well recognized and clinically well characterized group presenting definite social, economic, legal, medical and pathological problems of monstrous proportions. The largest single group of dependent and delinquent citizens thrust out of self-supporting society by disease and committed to the custody of the State is the dementia praecox group. A census of one of the largest institutions in Illinois in 1917 showed that sixty per cent. of the inmates were classed after months of observation as dementia praecox patients. There are 220,000 patients in the 400 institutions for the insane in the United States. If sixty per cent. of them are patients with dementia praecox, then 130,000 of them are suffering of a disease of unknown etiology, unknown pathology for which there is no effective remedy and, worse than all, no adequate efforts at study or research.

In spite of the magnitude of this problem there is a great scarcity of books and monographs dealing with the physical, chemical and biologic conditions of the unfortunate victims of this disease. There has not been published in the English or any other language during the past five years a book of 200 pages on Dementia Praecox, nor has there ever appeared in any part of the world a journal or magazine devoted to this condition.

In order to stimulate further research and to co-ordinate work already in progress in different parts of the world, it seemed desirable to organize a society for the study of dementia praecox, the chief function of which should be the establishment of a means of communication between its members. On July 13, 1917, in the city of Chicago, the Society for the Study of Dementia Praecox was organized. Dr. H. C.

Stevens was elected president; Dr. George Michell, vice-president, and Dr. Bayard Holmes, secretary and treasurer. Since it devolves upon this society to establish a journal to collect and disseminate information relative to this diseasse, the officers have resolved, therefore, to take the profession into their confidence and ask support.

"It will cost $600 to print and mail four numbers of 64 pages each, and another $600 for the clerical work of publication and circularization to secure 250 subscribers at $5 each. Therefore, 250 paid subscribers must be insured. The interested readers are naturally few. There are about 400 institutions in the United States for the care of the insane. The larger number of them are public hospitals unable to subscribe without such an amount of red tape as to make their patronage of little value for our immediate venture. The 3,000 medical officers in the service of the insane are said by medical booksellers and publishers to be liberal buyers. The trade in psychiatric literature is immense. Psychiatric journals, however, are few. We may reasonably expect by careful and persistent correspondence to secure one in ten of the psychiatric physicians of the country. The journal is to contain nothing but original matter, bibliography, and abstracts of current literature on dementia praecox. Each number will contain sixty-four pages of reading matter Some portions of the cover may be used for advertisements, but a periodical of such limited circulation attracts few advertisers." Following is the table of contents:

"The Present Status of Histopathology of Dementia Praecox," by G. B. Hassin; "A Study of the Statistics of Dementia Praecox from the Report of the New York State Hospitals for the Nine Months ending June 30, 1916," by Charles T. LaMoure; "The Rossolimo Tests in Dementia Praecox," by Herman Campbell Stevens; "The Abderhalden Reaction in the Diagnosis of Local Changes in the Brain and Other Organs," by Julius Retinger; "Catatonic Dementia Praecox—Report of a Case," by J. R. Ernst; "Adrenalin Mydriasis," by Solomon C. Fuller and Ralph M. Chambers; "The Victim of Dementia Praecox," by Bayard Holmes; "Notes from Histories of Recovered Patients" and Laboratory Reports.

From this one obtains a reasonably accurate conception of this worthy publication.

D. S. B.

THE TECHNIQUE OF PSYCHOANALYSIS, by Smith Ely Jelliffe, M. D. Nervous and Mental Disease Publishing Co., New York City and Washington, D. C. Price, $1.50.

The object of this work is to instruct the beginner in the principles of Psychoanalysis, viz., rationale, *modus operandi* and scope, as well as the technique properly so-called. The author points out the character of cases which should not be subjected to analysis, as well as those appropriate for it; by which it is evident he fully appreciates the limitations and dangers of psychoanalysis, some of the latter of which he considers at length.

The author believes that every sincere practitioner can practice psychoanalysis, but the scope of his work, whether limited to simple cases or extended to embrace the complicated ones, will depend upon his knowledge and skill, as is the case with the practice of surgery; but to become expert one should be trained in neurology and psychiatry, and, besides a familiarity with the standard works upon Psychoanalysis (a list of which is given), notably Freud and Jung, the psychoanalyst should study the Old Testament and Frazer's works on the Golden Bough.

The work will be found valuable to all interested in the subject, and all physicians should be interested in psychoanalysis whether they desire to practice it or only to inform themselves that they may select from their practices appropriate cases for treatment by a recognized psychoanalyst, thus rendering a real service to the afflicted, and protecting them, as well as the profession, from the quack and pretender.

D. S. B.

The Alienist and Neurologist

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THE SIGNS OF MENTAL DISORDER.

TRANSLATED FROM

KRAEPELIN, PSYCHIATRIE,

Achte Auflage.

By

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THE totality of clinical phenomena, which are produced by the disease process of insanity, we designate as the symptoms of insanity. Of these signs of disease, only those which present themselves as *psychic alterations* require a more thorough general treatment here. The various somatic signs of disease, symptoms of nervous excitement and paralysis of all sorts, vasomotor, trophic disturbances, etc., belong by their very nature to the province of neurology. Thus we can omit the delineation of the special mental symptoms associated with tumor, since they are usually treated of in the text-books of brain diseases. All these disorders, indeed, often possess a rather important significance for the recognition of the special disease processes concerned, but they do not belong to the signs of mental disorder as such, and will therefore receive more careful consideration later in the presentation of the disease forms as they occur at the bedside.

There are three directions, by and large, in which the manifestations of mental life appear, *the reception, impression, and mental elaboration of the material of experience, the fluctuations of the emotional equilibrium, and, finally, the execution of will impulses and activities.* In these three fields, therefore, we will have to look for the fundamental disturbances of the mental processes, from the multiplex combination of which we see the individual clinical disease pictures arise. By far the greatest multiplicity of phenomena is provided our analysis by that group of mental processes which includes the collection and preservation of sensory impressions, the elaboration of these into ideas and concepts, and finally the development of the higher processes of intellection.

A. Disorders of the Process of Perception.

The perception of an external sense stimulus, in general, is dependent upon two different conditions, to-wit: first, *the structure and function of the total peripheral and* *central sense fields*, and then on the *condition of the consciousness* which is to receive the impression brought to it. All disturbances which alter one or the other of these two fields in a pathological way, are also capable of influencing the perception of the outer world to a greater or less degree. Where the external sense-receptory organs have become incapable of function (blindness, deafness, etc.), or where interferences have developed which make the conduction of the impulses impossible, certain kinds of sensory ideas are simply non-existent in the fund of experience. In this condition, it depends on the general psychological importance of these sensory ideas, as well as on the possibility of substitution from other senses, how far the total development of the psychic personality is going to be handicapped. By far the greatest significance for the mental development appears to belong to the sense of hearing, probably because of its internal relation to the spoken word, to which we owe, more than anything else, the transmission of the mental development of past races. Though single cases (Laura Bridgman, Helen Keller) are known in which the loss of sight and hearing can be replaced to a certain extent with the aid of the sense of touch, by an extremely painstaking development, yet deaf mutes who are not so instructed, remain throughout life in the stage of mental enfeeblement, even though as frequently is the case, the deafness is not merely an accompanimnt of a more general brain disease. The blind, on the other hand, are not usually hindered to so marked a degree in their mental development by the lack of the sight perceptions.

Hallucinations.—A far greater clinico-psychiatric interest, however, is assumed by those disorders of the process of perception which are caused, not by a complete absence of processes, but by pathological processes in the field of the sensory pathway, by which is produced, not so much a loss of sense experience but a change in content, a *falsification* of content. Each sense apparatus is excited by any stimulus whatever, in a way which is peculiar and "specific" to the apparatus. It must, therefore, come about wherever the stimulus which produces the impression is not a usual one, suited to the sense concerned, that an *hallucination* arises concerning the nature of the source of stimulus. Thus, strictly speaking, the flash of light, the sound sensation on electric stimulation of the eye and the ear, the taste impression on mechanical stimulation of the chorda tympani, are to be regarded as false perceptions, even though we immediately recognize them as such on the basis of our physiological experience and with the help of attention, so that a further falsification of the content of consciousness does not result from it. Yet, under certain circumstances, in the mentally sick, especially in severer grades of clouding of consciousness, the subjective light phenomena occurring as the result of overfilling of the eye with blood, the roaring and ringing in the ears, can produce the idea of dangers threatening from fire and water, and the like, and in this way can cause the production of a real, unavoidable hallucination. Such sense falsifications, occasioned peripherally, have been called *elementary* because they bear the characteristics of simple, not complex, sense perceptions by reason of their point of origin in the stimulus-receiving surfaces. We can also contrast them, as sense hallucinations in the narrower sense, with the perception falsifications and falsifications of imagination, to be described later.

If we follow out the path of the nerves of special sense toward the cerebral cortex, we come to those levels at which the single constituents of perception, as they are provided by the sense apparatus, are combined into a total impression which then comes into consciousness as a sensory idea. Concerning the anatomical position of these centers, we can, of course, say nothing certain at this time; however, it is quite apparent, especially with regard to the clinical and experimental experiences concerning "mental blindness," that, at least in man and the higher animals, the so-called central sensory surfaces, that is to say, the end-stages of the sense pathways in the cortex, are to be considered as such. It is at once apparent that also *non-sensory* stimuli, as, for example, changes in the blood supply, poisons and the like, may call out conditions of excitation which are very similar to the usual stimuli through sense impressions and all the easier, if the irritability of the brain areas concerned at the given moment, is increased by any sort of influences. Under such conditions, therefore, any more or less composite sense idea which was not aroused by a sense stimulus but by physiological or pathological states of excitement in the higher levels of the sense areas concerned, can enter into the consciousness. Since it is induced equally as well by an external condition, we have to do here with a falsification of the process of perception, which depends on a deception concerning the true origin of the sense stimulus.*

This group of sense deceptions which can be designated as *perception phantasies* (deceptions of perception) because of their supposed origin in the "centers of perception," is the group which stands nearest to the ordinary perception. To be sure, these deceptions are usual in healthy people, in which case they come on quite often before falling to sleep (hypnagogic hallucinations), only quite exceptionally to gain a greater vividness. Under pathological conditions, on the other hand, the sense-like distinctness of the false perception may become so great that a correction of the error is possible only by the aid of the other senses. Like the pictures which come up in the field of vision when the eyes are closed, they are generally independent of the will and of any other train of thought and hence they come to consciousness as something strange, independent, arising from the outside, whose subjective origin remains completely hidden from it. For the same reason they also have a comparatively similar content, for the most part, slightly changing (stable hallucinations of Kahlbaum), repetition of the same words, at times meaningless, frequent perception of the same odor, seeing of definite patterns, flowers, animals and the like. Since they depend upon states of excitement, centrally located, they are not bound to the activity of the external sense apparatus, and so they come under observation even in complete obliteration of the sense nerves and of their first endings, the nerve nuclei. Their levels of origin are especially clearly proven by those cases with loss of one-half of the visual fields, in which the vacancies are filled out by false perceptions. In these the disease process, which excites the perception of real sight impressions, that is, the hallucinatory pictures, is evidently in the brain cortex. In the rare cases in which falsifications arose in the halves of the visual fields which were preserved, the cortex of both occipital lobes was found altered. In addition, the sudden starting up of active light sensations has been observed in sudden onset of double cortical blindness.

An essential prerequisite for the rise of falsifications of perception, is evidently the increase in irritability in the sense centers. Such an increase seems to take place, corresponding somewhat to the process of adaptation in the retina, on weakening or cutting off outside sense stimuli. Even in the healthy person, darkness and quiet most frequently give opportunity to observe the occurrence of active visual pictures or of false acoustic perceptions. So we see in alcoholics, quite as the usual thing, that the falsifications in the field of sight and hearing are increased considerably with the oncoming of night; now and then even the coverings of the eyes with a cloth is sufficient to call out visual pictures. In other patients, also, the visual falsifications usually come quite predominantly in the night. In the sound-free solitude of the prison cell, auditory falsifications are uncommonly frequent. In marked difficulty in hearing or in deafness, we not infrequently see well-developed and obstinate falsifications of hearing; Ranschburg observed a female patient who was hallucinated more in her right ear, the deaf ear. Blind people with disease of the optic nerve or of the eye, with clouding of the lens or of the cornea, at times have very active visual falsifications; they come on frequently in the dark room after eye operations.

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*Johannes Müller, Ueber die phantastischen Gesichtserscheinungen, 1816; v. Krafft-Ebing, Die Sinnesdelirien, 1864; Kahlbaum, Allgem. Zeitschr. f. Psychiatrie, XXIII, 1; Hagen, ebenda XXV, 1; Kandinsky, Kritische und klinische Betrachtungen im Gebiete der Sinnestäuschungen, 1885; Parish, Ueber die Trugwahrnehmung, 1894; Berze, Jahrb. f. Psychiatrie, XVI, 285; Uhthoff, Monatschr. f. Psychiatrie, V, 241, 1899; Norman, Journal of Mental Science, 1903, 454; Tanzi, Rivista di patologia nervosa e mentale, VI, 12; Goldstein, Arch. f. Psychiatrie, XLIV, 584.

In all cases, the occurrence of such falsifications is favored by the fact that the attention is directed to the sense region concerned, especially if its tension is permanently raised by emotional activities. Thus we often see the falsifications disappear as soon as the patient busies himself, or the transposition into a new environment, etc., is effected by a conversation, mental or bodily employment. Many patients cut themselves off as far as possible from real impressions in order to be able to pursue their falsifications of sense undisturbed; others try to produce lively perceptions, on the contrary, so as to get away from the hallucinations. Thus, I knew an inventor who made a small noise machine by very simple means, in order to drown out the voices which were bothering him.

On the other hand, it is not to be denied that external stimuli, also, play a supporting role extraordinarily frequently in the production of sense falsifications. The contradiction in this is only apparent. While distinct and clear sense perceptions attract the attention and repress the inherent irritability of the sense region, we are concerned here with such stimuli as are not in a condition to occasion sharp impressions but only give the attention a direction toward a definite sense field and so to increase the strength of its inherent activity. The experiences concerned in this question are uncommonly manifold. Hallucinations can cease, under certain conditions, as soon as the source of the corresponding sense has ceased; we must therefore assume that the gentle inherent activity arising in the sense organ gave the impetus for their arising. So we see those with auditory falsifications stop up their ears at times, in order not to hear the voices any more. In these cases it must always remain in doubt whether they are not always accompanied by the expectation of being able to avoid them just as they would avoid external perceptions. Frequently hallucinations appear to be induced by exciting conditions in the sense organs. In this connection, the communication of Naegeli is instructive. After a burn of his cornea with hot alcohol, he was for a long time able to observe before his bandaged eyes distinct visual hallucinations of complete sensory clearness. Hudovernig claims that a patient put a cotton wad in his left ear on account of noises and humming from which voices developed later, while Pick observed the crossing of auditory falsifications, till then one-sided, to the ear that was long deaf and not hallucinated, after a plug of cerumen had been removed from this ear. In the first case the pathological stimulus, in the second the return of external excitement, must have started up inherent activity in the central receptory sense surfaces.

In alcoholic deliria, as Liepmann has shown, it is possible by exerting light pressure on the closed eyes themselves, after the disappearance of the stormy disease phenomena, to produce distinct visual hallucinations, which resemble in their variegated appearance, in every particular, the false perceptions occurring in that disease; only they seem to stand less in connection with the world of thought of the patient and they do not seem to fluctuate, perhaps because the influence of the restless eye and head movements is lacking. Bonhöffer, who observed the same thing in the field of the skin sense, lays the chief weight, according to his experience, upon the interpretation. In favor of this is the fact that alcoholics, upon invitation, even read off words and numbers from a clear sheet; they see the animals which are shown them on the ceiling, hear the buzzing of a fly in the hand held to their ear, calls upon the telephone, and describe the objects which have been placed in their closed hands, ostensibly. The direction of attention to the sense field, effected by suggestion, causes the expected perception to arise in these cases; however, it is not to be denied that in these cases, at most, indefinite impressions, the shadows on the unevenly lighted paper, the specks on the ceiling, the ear sounds, and so on, provide the external condition for the hallucinations called forth. Similarly, the peculiar rhythmic voices in alcoholic delusional insanity, seem to be linked with the beat of the carotid pulse. In other patients, also, auditory falsifications, especially, are very frequently aroused by soft noises, the dripping of water, the sighing of the wind; Bechterew observed that in hypnosis, induced false perceptions were regularly brought out by the use of a buzzing induction apparatus. Moreover, in old cases with auditory hallucinations, there occur not infrequently chronic diseases of the middle ear and variations in the electrical reaction of the acoustic nerve.* Besides the simple hyperesthesia, there occur paradoxical reactions here and there, from the unaffected ear, and especially the most severe forms of disturbance, the reversal of the formula for the simple hyperesthesia. Jolly has demonstrated that in these cases it is often possible to produce the hallucinations by electrical stimulation of the acoustic.

Apparently the condition of the sense organ often plays a part in the production of *unilateral* hallucinations of perception. Half-sided visual hallucinations never show hemiopic limitation as one would expect, if they arose in the sense centers. Séglas mentions the disappearance of left-sided visual hallucinations by covering the left eye, in spite of double-sided representation of each visual surface in each eye. Moreover, there have been observed wandering of the false perceptions with the movements of the eyes and doubling by prisms or by lateral pressure on the orbit, phenomena which may point to the influencing of the false perceptions by real, though perhaps quite indistinct, visual pictures. It might be possible, however, that the fixed habit of determining the spatial position of the object seen, from the movements of the eye muscles, also influenced the production of the falsifications from without, and that the prismatic doubling alongside the objects actually seen, may have infringed upon the false perceptions arising independently from the retina, and this has been observed in hypnotic falsifications. Such psychic influences and influences like them, can also bring it about, as Seppelli observed, that the visual hallucinations get larger and smaller by looking through an opera glass, and that they even appear in the mirror. Colored glasses do not appear to affect the color of the visual falsifications.

Unilateral auditory hallucinations** are observed not infrequently, as already mentioned, in pathological conditions of the auditory organ concerned. Yet we should not assign them too great significance because, very often, in the later development, the hallucinations also involve the other ear. Of importance in these cases, without doubt, is always the condition of the central sense surfaces. Occasionally the content of the false perceptions, given by the two ears, is quite different; hostile voices appear to come more frequently from the left side. It is very enticing to attribute the occurrence of auditory hallucinations of different sorts to different brain areas, probably in both halves of the brain. Séglas, however, has presented the untenable nature of this idea in convincing manner. He points out the fact that speech arises only on the left side, so therefore auditory hallucinations with verbal content cannot arise in the right half of the brain, either. Then he took into consideration those fairly common cases in which not only two but many more different voices exist together, and in these their position is placed not only in the ears but in the abdomen, the breast and all other possible parts of the body. We must, therefore, come to the conclusion that here, too, as in the case of the visual falsifications, the spatial localization of the false perceptions is not essentially conditioned by the admixture of real sense impressions, but by developed mental processes. Where peripheral stimuli play a part they serve only as points of departure for the further general development. Bechterew was able to produce the auditory falsifications of a patient by simple stroking of different parts of the body.

Outside of the origin of perceptions without external stimulus, one sees at times the absence of perception of real stimuli. We are not speaking here of the non-attention to external impressions on account of failing or disturbed attention or in clouding of the consciousness, still less of the deficiencies which are brought about by disorders in the sense organs or the conduction to the brain. Frequently certain impressions or whole perception regions, even, under certain conditions, appear evenly extinguished in spite of undisturbed capacity for comprehension in other respects. If we wish, we can speak of these conditions as "negative sense falsifications." They are always of psychogenic origin and are observed only in hypnosis or in hysteria. The best known example of this is the hysterical anesthesia, which includes hysterical blindness and deafness. The half-sided visual hallucinations may even belong here; Séglas succeeded in producing the doubling of a unilateral visual hallucination by means of a prism and thus succeeded in proving that the false perception was seen by the other eye also but was not retained by it.

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*Jolly, Arch. f. Psychiatrie, IV, 495; Buccola, Riv. di fren. sperim., XI, 1, 1885; Redlich u. Kaufmann, Wien. klin. Wochenschr., 1896, 33.

**Robertson, Journal of Mental Science, 1901, April, 277; Séglas, Annales medico-psychologique, 1902, I, 353; Lugaro, Riv. di patologia nervosa e mentale, 1904, 228.

As a rule, the falsifications of external experience are accustomed to extend only to a single sense realm. However, certain relations exist between different sorts of disorders. A female patient of Séglas with left-sided visual falsifications, suddenly lost sensation on that side; the patient of Ranschburg, already mentioned above, heard voices on the left only rarely, but always in that case with feelings in the left shoulder. By far the most frequent are falsifications in the field of *hearing* and *sight*, more rarely in that of the three other senses and in the dark realm of those perceptions which we embrace under the group name of general sensibility.

For clinical consideration, Esquirol, and after him the majority of investigators from practical considerations, have differentiated two sorts of sense falsifications, such, namely, as do not have an external source of stimulus, *hallucinations*, and such as are to be considered only as the fasifications of an actual perception by additions of its own, the *illusions.** In the individual case, this differentiation is not infrequently extremely difficult or quite impossible. So especially in the contact senses (smell, taste and skin sense), we are almost never in a position to exclude with certainty the presence of any external cause of stimulus whatever (processes of decomposition in the mouth or nasal cavities, changes in blood flow, fluctuations in body warmth, and the like), and still less so, of course, in the disorders of general sensibility. Also in the case of vision, as already pointed out, undemonstrable stimuli under certain circumstances, for example, the endogenous light of the retina, endotic noises in the case of hearing and so on, furnish the rough material for the development of the false perceptions. In other cases, however, the various methods of origin are clear without further research. The fearful, the towering tree-tops, scurrying mists, are called spectres (Erlking) by the patient who interprets insulting words and reproaches from the ringing of the bells, the scratching of the pen, the whistling of the engine, the barking of the dog, the creaking of the wagon—they unquestionably have "illusions," while we must very evidently designate the well-known visual falsifications of alcoholics, the "voices" which reproach or felicitate the criminal in his quiet prison cell, as hallucinations. Between the two forms there are all possible transitions; however, the illusion is fundamentally nothing else than a manifold changing mixed form of normal sense perceptions with falsifying additions. We remember in this connection the fact that even our normal perceptions do not regularly give us an undeceiving representation of the sense impression but from the outset they contain a considerable admixture of errors of perception unknown to our consciousness.

The common peculiarity of this entire group of sense falsifications lies in their complete *sensory distinctness.* The condition of irritability in the brain corresponds throughout to that occurring in the ordinary process of perception, and the false perception arising takes its place in line with the other sense impressions and cannot possibly be differentiated from them. The patients not only *believe* that they see, hear and feel, but they see, hear and feel *in reality.*

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*Sully, Die Illusionen. Internat. wissenschaftliche Bibliothek. 1883.

A relation in many ways different from the above is furnished, on the other hand, by those improperly so-called sense falsifications which are nothing else than *ideas of special sense power*. The reappearance of an earlier impression, as a rule, never reaches the immediate distinctness of the sense perception itself, but it is differentiated from this quite unequivocally by its less marked vividness and sharpness. However, in this connection there exist distinct personal differences. While sufficient description of color and form is denied the memory pictures by many observers, others state, especially professional artists, that they at times yield only very little in sensory strength to the immediate perception; that is the well-known difference in vividness of memory for colors, forms and tones. And the sense equipment of the individual plays a large part in these cases. Where the visual ideas dominate the mental life, they will naturally provide a far greater wealth of sharp details than where auditory or movement ideas form the essential material of thought.

Under disease conditions ideas and memory pictures coming up, can apparently at times reach so high a degree of sensory distinctness that they are grasped by the patients as real perceptions of a special sort. Quite a number of investigators are of the opinion that all false perceptions are to be regarded immediately as imaginative ideas of extreme sensory vividness. Only the curcumstance that in the hallucinated not all, but only definite groups of ideas seem to play a part in the sense falsifications and that, besides these last, also ideas of the usual faded and formless sort are always going on, points to the fact that a special cause must function, if an idea is to possess the tangible distinctness of the perception.

The nearest and best recognized explanation of this relation is the assumption of a simultaneous *retrograde excitation of the sense regions in the brain*. We have seen earlier that the states of excitation of these last must assume the form of sense perceptions because even all sense perceptions can enter our consciousness only by means of those excitations. If it is therefore these brain sections by whose excitation the perception gets its sense characteristic, then it is logical to suppose a greater or a lesser participation of the same in the process of the lively renewal of earlier impressions. A similar view would especially well explain the fact that between the sense falsification of most complete sense distinctness and the most faded out memory, there lies an uninterrupted series of transitions, a condition which would be explained in the least strained manner by the assumption of a stronger or a weaker sympathetic excitation of the sense regions. It is possible that even in ordinary thinking the retrograde stimulus, the "reperception," as Kahlbaum called it, always takes place in very slight strength, and only when this process gets a pathological extent or when the sense areas are in a state of increased irritability, does the vividness of the memory picture approach that of the sense perception. There would result, so to speak, a certain relation between the strength of the reperception and the irritability of the sense regions; the greater the irritability of these last, the more easily would the memory pictures get the stamp of sensory distinctness, the weaker would the retrograde wave of excitation need to be, to produce them, and the more independent of the flow of ideas would they be. The limiting cases would be presented in hallucinations of perception described earlier, and depending upon local processes of irritation, and these present themselves to the patient quite strangely, as something pressing in upon him from outside himself.

The limits toward the opposite side are presented by those cases in which we can definitely recognize that we are dealing, not with essential sanse falsifications but solely with ideas of great vividness. By sufficiently thorough examination it is possible to limit the actions of the patient which point immediately to false perceptions, to the effect that the impressions have not really been sense-like but "inward," but that they are differentiated, nevertheless, from ordinary ideas by their convincing clearness. In this case we would have to consider the reperception very strongly developed, but the excitability of the sense areas not increased. For this conception speaks the condition that these last-named groups of *imaginative falsifications*, which have also been called *psychic hallucinations* (Baillarger), *pseudohallucinations** (Hagen), *apperception hallucinations* (Kahlbaum), include for the most part several or all sense areas in a consistent way and that they always stand in close association with the rest of the content of consciousness, while the falsifications of perception occurring at the other end of our series conceivably, as a rule, belong to a single sense region and remain throughout independent, in contrast to the course of ideas.

A significant explanation is offered by the comprehension of the sense falsification by means of those peculiar disorders which have been called "double thinking." This consists chiefly in the thought of the patient "coming out loud."** Immediately upon the arising of the idea, there follows a distinct auditory perception of the word thought of. Most frequently this associated hallucination arises in reading, somewhat less frequently in writing, but even then, if a speech idea comes into consciousness with sufficient strength; at times it is present, also, in simple thinking, or it links itself with any chance perception, a noise. It can precede or follow the process causing it; the voice reads ahead or speaks afterward or even at the same time. Soft or loud calling of the words, or even writing them, may cause the hallucinatory accompaniments to vanish. There always exist in addition, other auditory falsifications. I knew a patient who thought he was reading to the pleasure of his widely scattered friends by the aid of double thinking and who listened to their marginal notes.

As it appears, we are not always concerned in double thinking with a real hearing but frequently with a sort of inner speaking; it is not word sound pictures, then, but speech movement ideas, with which the thoughts are clothed. Cramer depicts a deaf and dumb patient who "heard" indecent things in finger language, together with words of praise in lip language. Also the hearing of speech in other parts of the body can consist in the perception of speech movement ideas. Many patients admit that they have sensations in the speech apparatus in this experience. Halbey† writes about a patient with visual falsifications who saw the sermon that he had heard, come up before his eyes in stenographic characters.

To explain these phenomena it is reasonable to assume an increased irritability of the central sense surfaces, on account of the falsifications. As such in the origin of speech falsifications, probably only the cortical area for word sound pictures in the left second temporal lobe comes into consideration. For this view at least one observation of Pick speaks very strongly, for he saw a luetic with sensory aphasia hallucinated with broken, senseless syllables. So we have to consider that under the influence of the reperception, either a continuous chain of abnormally vivid word ideas, following the flow of thought, immediately takes place or that the excitement extends to the region of the word movement ideas. Of importance in this connection would be the question of which of these aids to speech is usually preferred and is hence more easily addressed. Corresponding to this, the hearing of the thoughts out loud always takes place only in the language in which the patients think. It appears explainable in this way that the disturbance in real expression of the thoughts, in diverting of the excitement to motor pathways, can disappear; when it is concerned, apart from this, with an inner speaking, this coincides with the voluntary movement of expression. Also other forms of will tension can disturb the phenomenon. Kőpper writes of a patient in whom it disappeared as long as he was under tension and worked with interest, while it returned during leisure. In "speech becoming visible" the writing pictures are called up by the word sound pictures on the hypersensitive optic sense areas.

With the group of falsifications of the imagination there is also to be reckoned a form of visual falsifications, toward which Bleuler* has drawn some attention by the title of "extracampine" hallucinations. We are concerned in these cases with pretended visual falsifications outside the visual field. The patient, perhaps, sees a bird flying behind him, a brown knife behind his back. I remember a patient who thought he was able to look from behind into his body. Evidently these are only fancies with lively visual ideas which never really bear the impress of sense perceptions.

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*Lugaro, Riv. di patologia nervosa e mentale, 1903, 1 and 2.

**Klinke, Arch. f. Psychiatrie, XXVI, 147; Dőllken, ebenda, XLIV, 425; Probst, Monatschr. f. Psychiatrie, XIII, 401.

†Halbey, Allgemein. Zeitschr. f. Psychiatrie, LXV, 307.

The difficulty in differentiating imaginative ideas of nearly sensory vividness sharply, from the real perception, is the reason why, in mental patients the mixing of sense impressions with constituents which arise from their own fund of ideas, is so fatal a source of falsification of their experience. This process which we can oppose as *apperception illusions* (falsification of comprehension) to the forms of illusions previously mentioned, is frequent to a less extent under ordinary circumstances. The overlooking of a misprint is a well-known example of this. The speed with which we are accustomed to grasp familiar forms and sounds depends essentially on the fact that we strengthen and fill out without further ado, the general impressions rapidly taken up by memory pictures, for the most part correctly, but often enough incorrectly. No one can deny that even the perception of the normal man is very much under the influence of the anticipated meaning, especially if lively emotional activities cloud the clear and practical comprehension of our environment. Even then, the most calm scientific observer is not always quite certain that his perceptions do not unconsciously fit the views with which he approaches his object and the emotional activities are recognizedly in a position to give our total comprehension of circumstances so different a light that later the deviations from reality seem quite incomprhensible, often. In mental patients, however, the conditions for the rise of falsifications of comprehension are extraordinarily favorable; powerful emotional excitements, great vividness of the ideas and finally—a condition later to tbe considered more at length—lack of ability for a comprehending view and correction of experiences. So it happens that in these cases frequently, the sense impressions in the comprehension of the patient assume rather strange forms, and in this manner even where no real sense falsifications are present, they are in a position to provide the stepping-stones for a falsified comprehension of the outer world. This is the case when a patient takes the noises outside for the crying of her martyred children or for the "crackling of the fires of hell."

Naturally, a similar falsification of experience comes to reality easiest if the impressions given by the senses are not clearly and sharply stamped, but are *indefinite* and *blurred*. As in ordinary life, we misunderstand most frequently the indefinite perceptions, that is to say, involuntarily fill out and complete by our own additions, so in the mentally sick the deceits of comprehension also play an especially great role, if the distinctness of the sense impressions is influenced by any cause whatever, especially by disorders of the mental totality.

The falsification of the comprehension can also be brought about under certain circumstances by impressions from other sense regions. Kahlbaum has designated this process by the name *reflex hallucinations.* The perceptions of the single senses stand in so multiplex a combination with one another that a vivid impression can easily excite other sense regions with it. Fundamentally, in this category belongs the appearance of the visual picture of the cat if we hear its meowing. These relations of the single senses appear much more immediately in the so-called "secondary sensations," seeing of colors with certain sounds ("audition colorée), odors, etc. Sense distinctness is possessed by the onlooker at attacks of pain, the annoyance in the larynx when listening to a hoarse singer, the tickling at the threatened touching of the sensitive spots, the perception of a thrust directed blindly against us. Mourly Vold has shown, in addition, that even in our dreams, frequently, a similar transference of stimuli into ideas of another sense region is brought about.

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*Bleuler, Psychiatrische Wochenschr., 1903, 261.

In disease state similar processes often play a significant part. Moravsik was able to produce visual falsifications by tones from a tuning-fork or by sounds from a hand organ. Chiefly movement sensations, as they are so frequently associated with sense impressions even under ordinary circumstances, seem to arise in this way quite often.* Then there are patients who feel in their own tongues the words spoken within their hearing and in their bodies a glance, a movement, arouses peculiar feelings of tension or of restfulness. On the other hand, Juliusburger speaks of a deaf and blind boy who heard bells play a melody each time he tried to move his injured eyes in rhythm toward the right. At times such combinations assume very strange forms; patients feel "filled up" with soup, "sewed up," "drawn in" by their neighbors, etc. As a rule we may not be concerned in all these phenomena, especially with simple transferences of the sense stimuli into another path but with the co-operation of imaginations which are long past and which subserve the union of the associated sensations with the original impression by the way of more or less clearly conscious deliberation.

A very noteworthy property of sense falsifications which points in one case to the method of origin and in the other designates their importance as signs of disease, is the powerful, irresistible *might* which they usually possess over the total content of consciousness of the patient. It is true that even in people who are mentally quite normal, a definite false perception can arise in exceptional instances, and that on the other hand at the beginning or at the end of a mental upset, the falsifications are not infrequently recognized as such. But one almost always sees that stable sense falsifications overcome the sound judgment and that after a short time even the most senseless and fantastic assumptions are made by the patients to maintain the truth of the false perceptions against all sound arguments. Yes, even if the conviction of the pathological nature of the falsifications begins to assert itself during the convalescence, the patient is regularly carried away with them again at the moment of rising in the morning.

This peculiar phenomenon which finds an additional explanation in the impotence of real perceptions of evident appearance, against the disease falsifications, cannot have its simple origin, for this reason naturally, in the sensory distinctness of the false perception; on the contrary, experience seems to say that the force of the falsifications rather increases than decreases with the withdrawal of their usual sense properties. The explanation, therefore, is rather to be sought in the thorough agreement, perhaps unknown to the patient himself, with the cycles of thought which are going on in him, in the inner sympathy of the falsifications with his own pathological fears and wishes. Of great importance are the affect movements and shadings which give the falsifications content and tone, just as they support the emergence of definite series of ideas and influence the real perceptions. We observe very often, especially in the end stages of dementia praecox, that falsifications take place only in combination with the periodic fluctuations of affect so frequent in this disease, to completely disappear in the interval. The invincible influencing of thought and action by the falsifications decreases when either convalescence is established or the emotional activity disappears with the development of progressive dementia. In both cases the falsifications may still persist at first but the patient "does not pay so much attention to them;" they cease to play a part. So there are countless dements who hear voices constantly without working over the contents any longer, a proof that the force of the falsifications is quite dependent upon the response which they find in the soul life of the patient.

It is these considerations which speak with great clearness against the widespread comprehension that the sense falsifications may regularly or quite frequently form the

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*Cramer, Die Halluzinationen im Muskelsinn bei Geisteskranken und ihre klinische Bedeutung. 1889.

cause of the delusional ideas, the emotional variations, the activities of our patients. To be sure, the patients in their histories not infrequently point directly to the falsifications as the source and the reason for their disease phenomena, but there can be no doubt that the falsifications have arisen in the same brain as the other signs of the mental disease. As a matter of fact, the patients behave quite differently to the falsifications than to real perceptions. No normal person would refer the words of a passer-by, "that is the Kaiser," to himself or on account of these words really consider himself to be the Kaiser—in the mentally sick, in whom it forms the missing link in a chain of secret hopes and dim longings, such an hallucinatory perception can make the deepest and most convincing impression and can immediately bring the firm conviction not only that those words actually were spoken but that they also contain the pragmatic truth. So we would hold no one excused if he were simply to carry out the command really directed to him "kill your wife!" but we are accustomed to give a convincing force to the sense falsifications in patients, without more ado.

It is not susceptible of immediate proof that possibly the origin of sense falsifications may take place in very different ways. Even our earlier presentations pointed to the fact that certain forms of falsifications perhaps took their rise more in the peripheral parts of the sense pathway, while others took theirs more in those parts of the brain which serve the higher psychic processes. One may well speak, therefore, of a primary and of a secondary origin of sense falsifications, according to whether they take root in the inner life as independent influences or grow out of it, instead. As experience teaches, however, it is just the so-called secondary sense falsifications which possess by far the greatest power over thinking, feeling and acting. It is not the fact of the sense falsification or its content in itself, therefore, which works upon the patient so convincingly but only and solely the circumstance that the falsification itself is nothing other than his own production. We can, therefore, apart from the clinical differences mentioned above, lay no special value on this to differentiate whether, in individual cases, the delusional ideas, the tone, or the sense falsification accompanying, is of first value. In the overwhelming majority of cases, and especially in those cases where the falsifications accompany permanent delusion formation, all those disease phenomena are surely only the results of one and the same common cause, the various signs of the same disease totality.

The contents and the form of the false perceptions show a great variety in the individual sense regions. Under the *visual falsifications* nocturnal "visions" are most frequent, radiant figures, God, Christ, angels, the dead, flowers, or fearful faces, devil, shadow plays, wild animals and the like. These phenomena are comprehended now as transcendental revelations, now as false delusions, or they simulate in their strange and fantastic forms, in their rapid change and their variety of form, the false perceptions of the vivid, restless dream, as in the fever delirium. More closely approaching the real perception are the far rare visual falsifications which arise in broad daylight. To these belong especially the falsifications of the alcoholic delirious, scurrying rats and hobgoblins, numberless creeping vermin, butterflies, birds and flocks in the air, coins on the floor, wires and woven threads, actively moving, gay crowds of people. In other patients there are single forms, a black dog, wolves' heads, which look in at the window, faces on the bed cover, dark shadows, men hanging to a tree, blood, the face of a corpse. At times the pictures hide the real objects or they only let them shimmer through. At meals they find moulds, little heads cut off with moving eyes, wiggling worms; the objects of the environment have assumed quite a different aspect, show distortions, skulls, move, change themselves, especially in the peripheral visual fields. To these also belong certain cases of *change or personality*, in which the patients think that they see their relatives in strange persons or, on the other hand, do not recognize their relatives as such and claim that the same persons are constantly assuming other faces and forms, making grimaces at them and the like. In general, visual falsifications are susceptible of an explanation comparatively easily by other senses, especially the sense of touch, and are therefore regularly recognized as such by the well, under conditions otherwise favorable. Only where confusion, violent emotional strains, especially anxiety or far-advanced psychic weakness prevent an unrestricted test of the falsifications, are even the more gross and more strange falsifications of the visual sense taken up as real sense experiences and elaborated.

Far more pernicious in this respect are the *auditory falsifications* which occur as "voices," an expression which the truly hallucinated in the auditory sphere almost always understand correctly at once. The reason for this, apparently, lies in the fundamental significance which the cultivation of *speech* possesses for our thinking. Since we think in words for the most part, the "voices" are accustomed to stand in very intimate relationship with the total content of the consciousness; indeed, they are frequently nothing else than the verbal expression of what stirs the soul of the patient and, therefore, have for him a far greater power of convincing than all otherwise sensory falsifications, and especially more than the real conversation going on about him. The patient hears, at first behind his back, usually, all sorts of remarks which refer to him, accompany each of his actions, openly expose the most hidden occurrences of his past, insult him, threaten him, or bless him. Especially talk that is not quite distinct, words uttered half out loud, indefinite noises, gain content; the wagons "creak and rumble in a quite unusual way and tell stories, the swine grunt names and tales as well as wonderful attestations, the dogs insult and bark reproaches, hens cackle them, even geese and ducks quack names, single phrases and fragments of references." Out of the scratching of the steel pen, the ringing of the bells, the creaking of the boards, sound shouts against the patient, or out of the wall, out of the bed in which he lies, even out of his own ears, in his own head, in his body he gets the voices. Not infrequently they have different pitches and tone coloring and are accordingly ascribed to various persons; at times it is a whole troop, whose single members are sufficiently distinct and even carry on conversation back and forth; at times, it is only a few or a single one. The voices of their own relatives, faithless lovers, hateful neighbors, finally, those of God or of the devil, usually come most frequently. Often the voices are soft, whispering or faint, as from a distance, from above, or muffled coming up from the ground; less frequently, they are loud and piercing, surpassing anything else. They can so completely simulate the real perceptions that the patients at once place their faith in them. "If your words are really spoken," so they say to the physician, "it must be the case with the others, which I hear in quite the same way." Comparatively infrequently do the voices speak longer, coherent sentences; for the most part they are concerned with short, broken remarks. Beside the voices, there are heard here and there loud shooting and crackling sounds, bell tones, confused crying, rarely pleasing music, singing and the like. Often the patients, though they may deny it at first, can give verbatim the contents of the things heard; where that is not the case, we are not dealing as a rule with perceptions of sensory coinage but with convincing thoughts which very often are ascribed to strange influences.

Just in these cases is a *supernatural origin* frequently ascribed to the voices; they are then not infrequently accompanied by visual falsifications. God or Christ give the patient a charge, a promise, or explain to him a secret of his personality. Here the whole process usually has something dreamy, transcendental about it. In the fever delirium and in very confused patients, the auditory falsifications show the rapid change and the hazy confusion of the visual falsifications which occur under similar circumstances.

From the usual auditory falsifications which are like sense perceptions, are to be differentiated, as already pointed out, the so-called "inner voices," "suggestions," the "world speech," the "thought," the "telephoning," "telegraphing" and the like, which are grasped by the patients themselves, not as real hearing, but as suggestions or artificial influences. "It is between hearing and having a presentiment," said one patient. Here the origin from the patient's own flow of thought is very clear, as a rule. Apparently, we are concerned with processes similar, but pathologically presented, to those of the "inner voices," or the "voice of conscience" which "speaks" to the normal person also. At times this inner speaking attaches itself to another in the consciousness of the patient after the manner of a dialogue, so that the delusional idea ends in a sort of silent conversation with distant people. Or the "voices of conscience" accompany every act of the patient with corresponding remarks, animate him, give him commands or prohibitions. In all these cases the idea easily develops, just as in the "double thinking" described earlier, that their own thoughts are known to the environment or even that they are made and influenced by strange powers. "I am transparent," said such a patient to me.

The *content* of the auditory hallucinations is, as already stated, only rarely a wholly indifferent one and then, as a rule, senseless and monotonous. Often the voices stand in very close connection with the wishes and woes of the hearer, whom they excite and torment, rarely to bless and praise. They can then gain a powerful influence on the actions. The continuous abuses, insults and jeering remarks, the cries of abused relatives, make the patient suspicious and excited and bring him to a passionate defence against his supposed persecutors; fearful threats put him in anxiety and confusion and press him to ceaseless flight, to escape his pursuers; imperious commands make him execute the most senseless and, at times, the most unnatural acts, because he believes that he must obey supernatural forces.

Of far less immediate significance than the false perceptions of sight and hearing, from whose realms before all others the sensory material of our ideas is taken, are the falsifications in the realm of the *other senses* for the psychic life of the patient. The anxious patient gets the odor of poisonous vapors which are to kill him, or the sulphur odor of the devil who threatens him; he tastes all sorts of unappetizing and harmful things, human flesh, dirt, arsenic, cantharides, in his food, which are given him by his enemies. These false perceptions have their origin for the most part in the cycles of ideas of the patient, far less often in circumscribed disorders of the sense areas, as for example, falsifications of smell might arise by pressure of tumors or bony excrescences on the olfactory nerve or by cortical disease in the region of the gyrus hippocampus. As a rule we are dealing with the expression of general psychic revolutions. The same holds true of the corresponding falsifications in the realm of the skin and muscle sense, as well as the general sensibility. They occur on the basis of inhibition of thinking and will, in extremely vexing forms often, in circular states of depression; pains and paraesthesiae of all sorts in the different parts of the body, feeling of stiffness, of change in the skin, soft parts and even in the bones. Wherever we are met by the delusions of being influenced by electricity, of being possessed, of metamorphosis, of inner petrifaction and drying up, of loss of the head, mouth, stomach, we are no longer concerned with simple falsifications of perception but with pathological elaboration of sensations which *in themselves* are for the most part too indefinite to be capable of influencing the content of consciousness in such a way as the auditory and visual falsifications.

The great multiplicity of the sense falsifications has led us to the view that their method of origin must be a very various one. A powerful confirmation is given this idea by the experience that the sort of falsifications is determined in very definite manner by the *clinical form of the disease*. In fever and infection deliria we are dealing with variegated, changing, dream-like false perceptions, in which different sense regions work together to the productions of confused, strange experiences. Similarly are related the falsifications of alcoholic delirium, though here the relation of the single experiences is clearer, for the most part. The falsifications which, beside hearing, skin sense and muscle sense, concern the visual sense quite remarkably, have an extraordinary sense distinctness, in addition; they are linked so closely with one another that they may furnish the material for an "occupation delirium." Worthy of note is, finally, the predominance of similar false perceptions and their very active movement, which stands in close connection with the trembling restlessness of the patients, the rising, disappearance or fading. As in fever delirium, here also the falsifications are linked to impressions indistinctly grasped; they can be called out by suggestion and influenced. Closely related to them are the falsifications produced by cocaine which can extend to visual, auditory and general sensibility at once. Especially significant are, for this poison, the peculiar "microscopic" visual hallucinations, the perception of countless similar tiny individuals, animals, holes in the wall or little points. On the other hand, we are met in epileptic delirium in which also a combined action of different sense regions is frequent, chiefly by falsifications with active feeling tone, the seeing of blood, fire, frightful forms, heavenly visions, or the hearing of threats, shooting, war-cries, promises and angel music.

We may rightly assume that in all these cases where the falsifications of different senses combine with one another, we are concerned with extensive disease processes in the brain cortex. For this also speaks the fact that in these cases there are regularly more or less severe cloudings of consciousness. Moreover, the undeniable clinical differences in the form of the falsifications, in addition, points to the idea that the peculiarity of the single disease processes makes itself distinctly felt, whether it is in the variety of the disturbances themselves or whether it is in their extent and distribution. Transitory delirious states with quite similar combined falsifications of several senses, occur in many other diseases, also in manic-depressive psychosis, senile dementia, dementia praecox and hysteria. How far, in other directions, peculiarities in the form of the delirious sense falsifications correspond to the disease processes named is still very insufficiently recognized. In general, one may assume, perhaps, that in the excited stages of dementia praecox, the auditory falsifications stand in the foreground, while in manic-depressive insanity, in addition, those of vision and of general sensibility may especially play a large part. Even in hysteria visual falsifications predominate, mostly of peculiar intensive stamp, deeply veiled forms, dead relatives, men with long knives, etc.

A far more narrowly circumscribed group is constituted by those clinical forms in which the falsifications are limited to a single sense region, or even no combined action of the different senses can be recognized. A very instructive example of this is given in alcoholic delusional insanity, and certain alcoholic feeble-minded states in which, quite exclusively, auditory falsifications are accustomed to arise, mostly of threatening, rarely of complimentary content. Similar are many brain diseases of syphilitic origin, especially certain tabetic psychoses, to which the sensations of being worked upon by electricity may be associated. In epileptic mental disorders also, here and there only auditory falsifications come to attention. In the circular states of depression the patients hear single short remarks of disquieting content, while in the other conditions named, frequently, longer coherent sentences are heard in which several persons take part and which are almost never directed immediately to the patients.

By far the most frequent are auditory falsifications in that large group of cases which we now include under the name of dementia praecox. They are permanently lacking only rarely. As a rule they form one of the first disease signs and frequently enough they remain the only falsifications which are present throughout. There is, however, a greater number of cases in which, beside the auditory falsifications, similar ones of the skin, sense and especially of general sensibility constantly develop, as well as those of smell and taste. Here are frequently met the noteworthy disorders of the double thinking and of thoughts spoken out loud. The content of the falsifications is often exciting or gladdening only at first, later, perhaps, quite indifferent or senseless, in contrast to the forms presented above. These experiences point to the idea that the disease process which lies at the basis of these mental disorders favors the arising of auditory falsifications in quite special degree and that, in this, emotional influences have no significant weight. We may, perhaps, remember in this connection that the auditory falsifications occur in the form of speech and that precisely in these diseases about which we are here concerned we have to do extremely frequently with disorders of the motor speech expression. It would be thinkable that these two disease signs stand in some deeper relation to one another.

Clouding of Consciousness.—Besides the processes in the different divisions of the sensory fields, still another condition is of very great importance in the acquisition of experience, and that is the relation of our consciousness. External stimuli produce certain peculiar changes of conditions in our inner persons which are not more definitely explainable, which we grasp immediately and distinguish as ideas, feeling, impulses, etc. The extremely common facts of the inner experience we designate as "consciousness" following upon Fechner's views. In every case where external impressions are changed into mental processes, consciousness is present, for consciousness itself is nothing else than the expression of the occurrence of this transformation. The continuance of consciousness is not only dependent in general upon the performances of the cerebral cortex, but even the single phenomena of consciousness are evidently bound up with definite processes in our nerve tissues, which are still not understood.

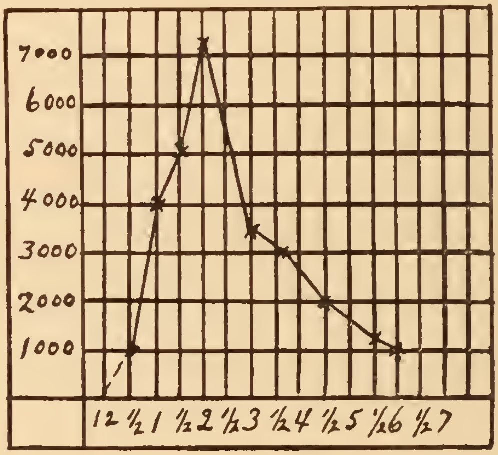
Just as the transformations of external stimuli into sense impressions is dependent upon the condition of the sensory apparatus, so to a like extent the conditions of the cerebral cortex are of distinct significance for the transformation of physiological excitements into conscious processes. To what extent such a transformation takes place is at times very difficult to recognize in single cases, since the inner experience of another person is not accessible to us by immediate observation, but only by an inference from his external reactions. From the conduct alone we conclude with greater or less certainty whether the conduct is to be considered as an expression of mental processes or not.

That state in which the transformation of bodily impulses into mental processes is completely removed, we designate as loss of consciousness. Every stimulus which is to cross the threshold of consciousness and in so doing is to produce a mental impression, must possess a certain strength which cannot fall below a certain value, the so-called threshold value. Even the size of the threshold value varies extraordinarily according to the condition of our cortex. While it reaches its lowest value in concentrated attention, it can be infinite in deepest syncope; that is to say, in this condition even the strongest impulses are no longer sufficient at times to produce the conscious processes. Accordingly, one can distinguish various degrees of clearness of the consciousness, depending on the size of the threshold value. If the clearness of consciousness falls below a certain point there arises a "dream state" of greater or less degree, in which external as well as internal stimuli only produce weak and hazy mental pictures. We observe similar cloudings of consciousness in epilepsy and hysteria, in the form of transitory disturbances which are often sharply contrasted with the normal life. On the other hand, along with continued dream states may be recognized certain stuporous forms of manic-depressive psychosis in which the psychophysical threshold value is raised.

Of course, at times the threshold value for external and for internal stimuli can be changed in an improportionate manner; while the influence of external impressions is to a large extent impaired, yet active conscious processes may be brought about by inner excitements. That is the case in those states which we are accustomed to designate as "delirium." On the other hand, we not infrequently see in dementia that external stimuli still produce sensations comparatively easily while inner processes have practically no more value in consciousness. We are concerned here, as a rule, however, not so much with a rise in the threshold value, but with a permanent lowering of the psychophysical irritability. Dementia is differentiated from dream state by this very thing.

Sleep is the most frequent dream state and the one best known to health. In sleep we have succeeded fairly well in following by experiment the variations in depth of sleep and so the degree of clearness of consciousness in sleep, by determination of the stimuli which suffice at various times during the night to wake the individual. An example of the "curve of the normal depth of sleep" is given in Fig. XVIII, in which the abscissae represent the hours of the night from 12 to 7; the ordinates, the strengths of sound in gram-centimeters, as they are produced by steel balls falling upon an ivory stand. As is apparent, the "Waking values" in general increase rapidly at once after sleep comes on and sink again just as rapidly, to reach their lowest values with variations towards morning. In day laborers the greatest depth of sleep lies at the end of the first hours of sleep and after a few hours is very small again. On the other hand, night workers appear to reach their greatest depth of sleep much later and at the same time it is much shorter than that of the first group. It also sinks more slowly then and remains at a more considerable height till awakening.

Disturbances of sleep are uncommonly frequent in our patients, yet we still know little of real value about them. They can affect the period of falling to sleep, the deep sleep, and the awakening. Falling to sleep is accompanied as a rule by a feeling of the need of sleep, the tired feeling. This need of sleep may be completely lacking in states of excitement, especially in manic patients who often feel bright and wide awake in spite of very insufficient sleep and great bodily exhaustion. In this connection we will recall the fact that even in the normal person, where work is excessive and continued beyond reason, the feeling of fatigue which is extremely pressing at first, may be lost; the forerunner of insomnia. In alcoholic delirium and in senile dementia, both forms of disease in which the unrest comes on at night or is increased at that time, the need for sleep likewise seems to fail, to set in again, often in an exaggerated form in the daytime, in the latter disease. An increased need of sleep without particular fatigue often confronts us in the nervous; in these people we are in reality concerned with an anxiety which paralyzes the power of action, which appears to them as a sign of a need for sleep. Likewise, in many stages of dementia praecox, a greatly increased need for sleep is observed.



On the other hand, great fatigue may be present without sleep setting in. This is especially the case in those forms of nervous insomnia in which the lively wish to sleep and the anxiety over failures to sleep prevent the onset of sleep. The states of depression stand in a very similar relation. In them the predominating affective tension may banish fatigue; but frequently these patients feel extremely tired and in need of sleep, without being able to sleep. Frequently the going to sleep is delayed but follows after long waiting in vain or after repeated sudden starts.

Only very uncertain hypotheses can be made concerning the relation of the deep sleep in our patients. We may presume that delayed falling to sleep will, in general, be followed by a less deep sleep and the depth arrived at more slowly; in manic patients the sleep is usually short but very profound. In many psychopaths, especially the young, we find the sleep to be long and at times unusually deep, while others, more of the anxious and the depressed types, regularly start up frightened at the slightest sound. A very sudden shallowing of the sleep after a rather short time is also frequent; the patients soon fall asleep and sleep soundly, but quickly awake again and lie for hours without being able to fall asleep again. The opposite appears in those patients whose sleep is still so deep in the morning that for some time they have to struggle with that dulling tired sensation which only gradually wears off. Similarly for the day worker with the very abrupt curve of sleep-depth, the noon-day nap appears to work out as a "fatiguer." While the night worker awakes fresh from a short sleep, of slight depth; too rapid deepening of sleep, conditions a longer sleeping period with awakening from greater depth, which apparently does not permit the feeling of refreshment to come out.

The disturbances of awakening have considerable practical value. Awakening takes place in the normal quite suddenly, for the most part; only at first a certain heaviness of the limbs and of the head may still be present especially on waking from a comparatively deep sleep. As Gudden has shown,* the process may be shifted in such a way that presence of mind and the power of action do not return at the same time, but the former appear earlier and the latter later, or *vice versa.* In the former case, the waking person is still as if paralyzed at first and only gradually assumes control of his limbs; in the latter case he remains for some time senseless and confused and so can execute very dangerous actions at times. This condition of "sleep drunkenness" develops easiest on awaking suddenly from very deep sleep, mostly in the first hours of sleep and in young persons whose depth of sleep is in general greater, especially after severe exercise. Increased emotional tension, as, for instance, in soldiers in time of war, also active anxiety dreams and finally alcoholic poisoning, favor the institution of the sleep drunk, as do unusual position, heat in the bed-chamber and strange surroundings which make a quick comprehension of the situation difficult. The severer grades of sleep drunk are observed only in persons with psychopathic tendencies, especially in epileptics and hysterics.

Even in sleep the relation of the external threshold value to the internal may be displaced to the disadvantage of the first. The phenomenon of dreaming bespeaks this, for dreams are usually lacking in deep sleep or occur without leaving a trace. Dreams are often very similar to twilight states. De Santis** points especially to the fact that the dreams of epileptics and of hysterics may have the same contents as the delirium of patients, in some cases frightful realizations of blood, flames, threatening monstrosities, heavenly visions or voluptuous experiences, in other cases, theatrical events, appearance of the dead, of single threatening, admonishing or moving forms. So he is of the opinion, and not without reason, that dreams of this nature may be the exact equivalents of similar disturbances occurring when awake. They are repeated periodically, at times in quite similar form. A like significance is attached to states of night-walking (somnambulism), in which patients get out of bed with closed eyes or with eyes open and staring, to carry out all sorts of simple performances and then to lie down again. Less severe disturbances, talking and anxious starting up in sleep, are also observed in the normal, chiefly in children and in interference with nose breathing.

In states of depression, the anxiety dreams and the horrible dreams usually correspond to the coloring of the waking state. Even delusions may continue to develop in dreams. Especially frequently do we meet the statement of hostile influence being excited during the night. Patients tell us of nocturnal coitus, and complain that some one has "drawn off their vitality" or has brought about changes in their bodies. It is often doubtful how far such statements actually go back to dream experiences; Pilcz found, in this connection, that paranoid patients do not dream of their delusional ideas. But not infrequently patients mix dream and reality; I remember a patient who reproached the physician almost every day with what he had done to him again in his dream. In progressive dementia the frequency and vividness of dreams disappear with the loss of mental responsiveness.

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*Gudden, Arch. f. Psychiatrie, XL, 989.

**De Santis, I sogni, 1899, German Translation by O. Schmidt, 1901.

Disorders of Comprehension.—The culmination of the influence of an external stimulus requires a definite time. Experiment shows that only after a period of several seconds is the greatest clearness of a sense impression reached. This process can suffer a considerable delay, under certain circumstances. Patients are then unable to grasp stimuli which are given them only briefly, or they grasp them only very incompletely, while under ordinary circumstances no difficulty of perception may be felt. However, if the delay in the culmination of the sense impressions is a very long one, then the fading of the impressions which begins shortly, may completely prevent the full development of the perception; the impressions sink away again before they have reached full definition and strength. Naturally, single impressions which are very strong at the outset may be grasped, but they remain more or less incoherent because the connections and the accompanying events are transmitted to consciousness only in an indistinct and hazy form. In its most expressive form, we meet this disturbance of perception in presbyophrenia and in Korssakow's syndrome, though less marked forms of the same thing may be found in quite a few other conditions, especially of a delirious nature.

The comprehension of an external impression, however, requires, in addition to the rising of the perception to a certain strength, that it become an integral part of our fund of experience. The great majority of the impressions which we receive daily are in themselves rather indistinct and hazy; they only become clear and valuable experiences by finding an echo, so to speak, in the memory pictures which lie close by, an echo which increases the sensory stimulus. By this process which Wundt designated "apperception" the linking of the single impressions with our total experience at once takes place, a connection with numerous other ideas and so the "understanding" of the impression we are receiving. In this way impressions which are insufficiently grasped find their completion by memory pictures which present themselves, a process which increases the sensitiveness of our comprehension of known impressions extraordinarily but which, at the same time, also contains within itself the danger of falsifying perceptions. Even observations on common illusions show us best to what a high degree the sense experience is influenced by the concomitant action of our memory store.

The reminiscences which an impression calls out in our inner thoughts, arise immediately in the memory pictures of earlier experiences of a similar sort. However, since every perception is composed of a large number of single impressions, each of these constituents will be capable of arousing simple memories for itself, as, for example, a certain tone or a color, and in addition ideas of a more complex sort will depend upon the united members of the total impression. So we recognize trees or animals in a certain part of a picture, a well-known melody in a series of tones. The ideas called forth may then be definite single memories or general concepts; a picture brings a personal experience before our eyes or it appears to us somewhat like "a landscape at even-tide." Finally, however, the stirring up of former experiences extends to other sensory fields also. The visual picture of a dog calls up the idea of his barking, of his smell, of the softness of his coat, of the coldness of his nose when on the alert, and then follow all sorts of single personal memories with general ideas. Then, since the various speech symbols can be joined with the thought connections which belong with them, the net of ideas which arise more or less clearly according to the mental responsiveness and the fund of experience of the perceiver, may reach a very wide range under proper circumstances.

The purely sensory understanding of an impression forms the ground work for its further mental elaboration which may take place in extremely various directions. To the clothing with similar earlier perceptions is linked the emerging of more ideas and thought processes, which make possible a constantly increasing insight into the meaning and the worth of what we comprehend, its narrower and broader relationships to other experiences and to our own ego. We recognize not only that a picture represents a landscape, not only the locality which it depicts, but also its artistic qualities, the authorship of a certain painter, the technique, the age, and the value; we grasp not only the details of speech sounds, but we know what language they belong to, what they mean, the peculiarities of enunciation and expression, a hidden meaning. If we were to prvent the immediate comprehension of the sense impression and perhaps also its being linked with the experiences of senses belonging to it essentially in the central sensory surfaces, yet the extensions for the understanding of a thing are formed by mental processes so complex that additional areas of our sense organs must be concerned in its taking place.

As soon as the co-operation of our earlier mental acquisitions fails in the process of perception, the latter becomes indistinct and void of content. Single stronger impressions may force themselves into our consciousness, but they do not stick and are not understood, since they lack the arrangement into connections of our ideas and concepts, with all their results for the further mental elaboration. We find ourselves in this position, for example, when concerned with what is completely unknown to us or incomprehensible to us, so far as special concomitant circumstances, expectations, etc., do not condition the excitation of definite ideas through the perceptions. The details of a landscape seen upside down, of a foreign language, may completely escape us although the sense impressions in themselves may affect us just as keenly as the picture right side up or the mother tongue. Single syllable words and even two syllable words are read very much faster than meaningless syllables of far fewer letters.

The most frequent form of disturbance of the comprehension is the raising of the threshold value for external stimuli which hinders the accessibility of our consciousness. The stronger the stimuli have to be in order to produce sensations, the hazier and more incomplete is the picture that is thrown into our inner mind by the external world. Patients grasp only a more or less isolated part of the impressions which affect them; they no longer notice or understand what goes on about them. We designate as *lack of discretion* that condition in which consideration disappears. Though in this condition a perception can still be forced transitorily or by especially strong stimuli, still, in the severer grades of mental dulling the connection with happenings outside is dissolved more and more. Quite frequently patients in this condition are able to grasp single impressions very well without being able to work them up into a total view of the situation. Therefore they do not get a picture of their surroundings and of their positions; all occurrences appear incomprehensible to them, mysterious, puzzling. The gradual development of these errors of comprehension is met in simple weariness and its transitions into sleep, but is seen also in the pathological conditions of severe mental exhaustion. With the greatest force and speed the blocking of our consciousness from the outer world takes place under the anesthetic influence of ether and chloroform. So far as the proof goes, by means of the psychological experiment, the influencing of the perception produced by a number of soporifics, is to be judged similar; already sufficiently well proven has been the severer disturbance of comprehension produced by alcohol, paraldehyde, and trional. According to our clinical experience, it is present also in the deliria of fever and of poisoning, in delirium tremens as well as in epileptic and hysteric twilight states, often also in the various states of manic-depressive psychosis, especially in the depressive and maniacal stupor, and in the severer degrees of manic excitement.

At the level of simple perception the total sense experience remains at the beginning of mental development. Just as long as the influences of the outer world leave behind no permanent traces in memory, just so long is that web of psychological relationships unwoven which at once puts all incoming experiences of life into combination with the mental acquisitions of the past. In the severer forms of retardation of mental development, this condition remains unchanged; the possibility of a progressive clearing-up of this mental twilight life is forever cut off. The consciousness remains filled with a hazy mixture of single cloudy ideas and ill-defined feelings in which no distinct comprehension, no circumspect arrangement and grouping is possible. On the grade of mental development which is reached depends the formation of a deep material understanding of the experiences. Incompleteness and shallowness of mental development characterize those conditions which we include under the name of imbecility.

In more circumscribed disturbances, in the inability to link the sense impressions which offer themselves, with similar earlier experiences in the same sense field or with the corresponding memories in other sense fields, there arise the phenomena which are designated as *agnosia.* In this condition the recognition of the outer world is difficult to bring about in one sense field in spite of undisturbed perception, while it succeeds without difficulty in another sense field.

Disorders of Attention.—The fact that only a limited number of mental pictures is present in our inner field of vision is designated as "the narrowness of consciousness." While the complete chain of our mental reflections surpasses this narrow limit, our inner life presents itself as a constant coming and going, as a rising and sinking of mental processes. At first still hazy and weak, one inner experience after another comes out of the shades of the unknown, after a brief time to reach the greatest clearness and strength, again to disappear and make room for the next. At the high point of its development this process becomes a determinant of the direction of those inner acts of the will which we call *attention;* our sense apparatus turns itself to the impressions which are actively presented and such ideas arise as strengthen the process which has attracted our attention. This "straining" of the attention which can take very different degrees and directions, is accompanied by certain bodily phenomena which may be recognized by their properties as acts of will, feelings of innervation in the eyes and ears, even distinct movements, changes in breathing and in the pulse as well as in blood pressure.

The activity of the attention, however, serves not only to the strengthening of the arising mental process, but it also exerts a very distinct influence on the future development of the conscious processes. The development and disappearance of an idea requires a certain time. According to experiments which have been performed on the influence of a sense perception on the strength of another following sense perception, we may assume that the greatest distinctness for the single members of a series of ideas may be reached, if they follow one another with an interval of about two seconds. This time appears to be necessary for the full development of an idea, that is to say, for the exercise of attention. In reality, however, the individual perceptions and ideas follow one another much more rapidly. That is possible because the narrowness of consciousness gives the same space not only to a single mental picture but also to a whole series, of which only one is illuminated brightest while the others are only grasped in the development or fade out again. We are concerned, as we are accustomed to say, not with an inner visual point but with a field of vision in which, beside a place of greatest distinctness of inner perception, are to be found the most varied steps to the unknown.

The strengthening of an emerging impression by the attention, without doubt has the effect of delaying its disappearance. So the impression gains an influence on the mental pictures arising after it, the development of which it can retard or promote according to its inner relationships to them. In this way the originally *passive, chance* attention becomes selectively active. It is not the strength of the external impressions but far more their being favored or suppressed by the attention, that is of importance for the inner experience.

The content of consciousness of the child stands in helpless dependency on chance circumstances; the child perceives only the strongest stimuli without regard to the inner continuity of things, because he lacks those general ideas which allow the less striking perceptions to come out also, as essential members of the chain of experiences. In adults, on the contrary, the perception process is more and more controlled by the special tendencies which gradually develop out of the life experience of the person. We *practice* ourselves in noticing single impressions especially, while the responsiveness of our ideas for these impressions becomes progressively stronger, so that slight hints suffice to find active response in our inner life. On the other hand, we *accustom* ourselves to let daily stimuli go by without note and we give them no room to influence the course of our psychic processes. This formation of definite "points of view," of certain directions to our "interests," leads to an extraordinary variability of the threshold value, so that at the same moment we can let very strong stimuli pass by unnoticed, while we comprehend the finest changes of any other object, with the greatest keenness.

In disease states the relations of the attention can show manifold disorders. In any case where the mental responsiveness is chiefly affected, in all advanced stages of dementia, we also find a *dulling of the attention.* To the perceptions there are no intensifying memory pictures linked quickly and actively, they gain no relationships to the experiences of the patient and they do not, therefore, occasion him to follow the event from his own initiative. In the vicinity of a demented paralytic the most exciting happenings may take place without stirring him, even though he may perhaps still understand commands and questions. Quite different is to be considered the very marked disturbance of attention which is observed in dementia praecox so uncommonly frequently, even from the first stages of the disease as a rule. Here are seen patients, especially in the stuporous states, who are frequently completely unapproachable to all attempts to excite their attention so that even needle pricks and rubbing the cornea excite no voluntary movements. But we can easily determine that there is no dulling of the attention, but a pathological suppression of the attention. The patients often perceive correctly what goes on about them, but they involuntarily resist every influencing of their thinking and acting by these perceptions. Even the external signs of the fixation of attention, the turning of the head and of the eyes, the fixing of the direction, apparently even the changes in breathing, pulse, pupils may be completely absent. We would designate these disorders which correspond completely with the negativistic processes in other will activities, as *blocking of the attention.*

Superficially similar but essentially different is the *inhibition of attention* which we find in certain stuporous states of manic-depressive psychosis. It is difficult here also to get into mental touch with the patient, but only for the reason that in him the inner response is lacking which makes possible the linking of the outer impressions with his own fund of experience and, by so doing, arouses the selective activity of the attention. The production of ideas is made difficult, not by destruction of the mental life but by processes of inhibition, so that the perceptions can gain no far-reaching influence over the inner life. On the other hand, the external signs of the activity of the attention, in contrast to our experience in dementia praecox, are usually retained; the patients look questioningly around, though understanding nothing, notice objects offered, turn their heads at noises, etc. In contrast to this disorder, there can frequently be observed an *increased activity of attention* in the manic phases of manic-depressive psychosis. The receptivity for external impressions is raised in this condition; each stimulus is taken up quickly and with great decision, each detail taken into consideration. The patient "is interested" in all possible things that catch his eye and cannot willingly pass over anything.

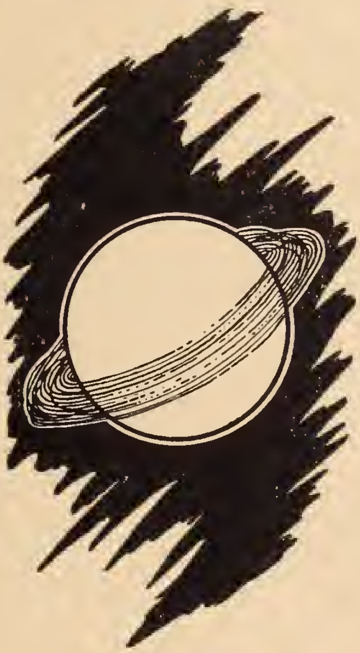
An immediate result of the interference with psychic connections, whether from dulling or from inhibition of the attention, is the loss of its determining influence on the perception. In this connection, it is quite possible that the single impression may still awaken the attention and be strengthened by it, but there is lacking the continuation of these inner movements beyond the moment, with their results for the selection of coming perceptions. The patients, perhaps, dwell longer upon the impression once given them, but they can be distracted at once by a new stimulus if it is only powerful enough. This *precision of attention* is observed especially in general paralysis and senile dementia, but also in the above-mentioned stuporous forms of manic-depressive psychosis and in many infectious exhaustion states. The patients resemble in certain respects the child without experience, in whom, because of his lack of experience, no ideas or memories are awakened which could be of determining power in directing the attention. In those mental weaknesses in which the mental development is permanently at the level of the child, the attention also remains dependent and ascertainable throughout life.

That disorder of attention which is usually designated as *heightened distractability* must have an essentially different mode of origin. Here we are concerned with a frequent change of the direction of the attention from internal and external motives. While the definition of attention is essentially conditioned by the lack of such ideas as may influence the process of comprehension, we have to do in the above condition, supposedly, with a greater lability of the mental processes. In favor of this view speaks the fact that, in this condition, the attention jumps quickly from one impression to another, though we attempt to hold it in the same direction. Moreover, we find this disturbance quite especially in such conditions as go with the signs of a heightened excitability. We may, therefore, represent to ourselves that, in heightened distractability of the attention the single impressions quickly fade out again, and therefore gain no directing influence on the coming perceptions. They form no closely linked chain but a gaping series of single processes, inwardly unconnected. According to the deviation brought about by presenting ideas or by external stimuli, one can differentiate the internal deviation from the external which frequently but not always is associated with it.

The lightest grades of this disorder are met in that state of absent-mindedness which habitually comes on in the fatigued, together with the signs of a certain restlessness. We note there that the impressions received possess very slight tenacity, quickly fade out and lose the inner connection. In spite of every endeavor we are no longer in condition to follow out a series of projects consistently, but repeatedly catch ourselves being distracted by chance accompaniments and our tasks taken up in a slip-shod manner. In chronic nervous exhaustion this lack of capability may last for a long time, as well as in the convalescence from severe mental or bodily disease. Much more strongly expressed is the heightened distractability in the excited phases of paresis and in the infectious mental diseases, and especially in mania where it may be combined with increased activity of the attention. In this condition an interjection, a single word, the exhibition of any attraction whatever, is sufficient to change the direction of the attention at once. It must, of course, remain undecided for the present whether we are concerned in these manifold disorders with the same disturbances of attention in all.

Increased distractability of the attention occurs as a lasting peculiarity in certain forms of psychopathic tendency. It is probable that this disorder must exert a far-reaching influence over the total mental production. The more suggestible a man is, the more his comprehension is influenced by chance stimuli which may present themselves rather than by systematic choice, by just so much less is he in a position to create a consistent and unified stock of ideas. The various perceptions will join one another fragmentarily and immediately without any inner bond, formed by the power of leading general ideas. The comprehension, therefore, grasps only details without offering a view over the whole; it becomes superficial and fleeting and never pushes into the deeper coherence of phenomena. So it may happen that the comprehension of the single impression shows no essential disturbances while the unsteadiness of perception, the total inability to *observe*, makes impossible a deeper understanding of the outer world and with that chiefly the higher mental development.

The opposite of increased suggestibility appears in that *shackling of the attention* by single outer or inner processes which makes us unapproachable for other perceptions. To this belongs the wrongly so-called distraction of the professors in so far as it depends on the highest onesidedness of the direction of attention. Perhaps we have to do with similar processes in many pathological states. Thus, especially depressed patients are at times busy with their sad ideas in this way, so that they become careless of the impressions of the outer world, even though the power of comprehension in itself shows no demonstrable disorder. In many delirious and stuporous states the difficulty of influencing the comprehension may also be due in part, perhaps, to the activity of the inner processes, by hallucinations, and imaginary ideas which take up the attention entirely. At least, this appears to be the case in katatonic stupor, and in this condition also, the ability to comprehend usually shows no disturbances or only comparatively insignificant ones.



A CASE OF POSSIBLE INSOLATION.

By

EMIL AMBERG, M. D., Detroit, Michigan.

Read before Detroit Society of Neurology and Psychiatry, January 4th, and February 7th, 1918.

THROUGH the kindness of Dr. Freund and Dr. Haass, I was allowed to see S. W., male, 36 years old, laborer, who exhibited nystagmus after an attack of insolation. I was interested in the patient primarily from an otological standpoint.

According to the United States Weather Bureau, the temperature and humidity on the dates mentioned below were as follows:

Temperatures: July 29th, maximum 94°, minimum 76°; July 30th, maximum 94°, minimum 72°; July 31st, maximum 95°, minimum 76°.

Humidity: July 29th, 81, 49, 59; July 30th, 77, 30, 59; July 31st, 69, 52, 53.

History, mostly from hospital records:

While working during the hot weather, the patient became unconscious and was taken to Harper Hospital, July 31, 1917. At noon patient had partaken of one glass of beer. He was still unconscious in the hospital. After twelve hours he became conscious and spoke, saying he felt "all right." The temperature at 5:45 P. M. (rectal) was 108.6; pulse 156. Ice caps applied to head, cold sponges. Camphor in oil gr. iii, caffein, sodium benzoate ampoule (1) given, Fisher's solution qt. 1 per rectum and about 150 c.c. intravenously. Dr. H. B. Schmidt reports: Edema of lung, rales over both lungs, frothy sputum, patient intensely cyanotic and in extreme dyspnea.

Nine P. M., temperature 101.2 degrees. The temperature went down gradually with an exacerbation on August 3rd to 102.8 degrees. Patient was taken home August 4, 1917, against advice, and at own risk, with temperature of 100, p. 88, r. 20. Blood, Wassermann, August 4, 1917, negative. Diagnosis, heat stroke.

Patient was again admitted to Harper Hospital, September 24, 1917. Pain in the occipital region, dizziness and staggering gait. He has not vomited. He becomes worse. Family history negative. Past history: Patient not subject to headache. No history of injury. Pneumonia five years ago.

Head: No injury. Beyond present illness, no dizziness, loss of consciousness nor headache.

Eyes: Never had squint or nystagmus before eight weeks ago. Vision good. No ptosis, conjunctivitis, exophthalmia nor endophthalmia. Pupils negative.

Nose: No injury, obstruction, purulent discharge, nor nose bleed.

Mouth: No ulceration, teeth have pained him. No tonsillitis or peritonsillary abscess, no loss of voice.

Neck: No tumors, abscesses, thyroid enlargement nor injury, no pulsation.

Face: No atrophy, no paralysis, no injury.

Skull: No injury, exostosis, areas of tenderness, tumors nor depression.

Central Nervous System: Up to eight weeks ago no paralysis, tremor, paresthesia, hyperesthesia, atrophy, hallucinations, illusions, ulcerations nor difficulty in locomotion or speech.

Habits: Has not drunk beer recently, never to excess. No whiskey. Habits regular. Sleeps well.

Ears: No earache, no discharge, nor injury. History of dizziness, began eight weeks ago.

Thorax: Respiratory; no history of chronic cough, dyspnea, loss of consciousness up to eight weeks ago, no night sweats, loss of weight. Pneumonia five years ago.

Cardiac: No history of shortness of breath, palpitation of heart, apnea, edema or precordial pain.

Abdomen: No history of chronic diarrhea, obstruction, colic, nor history of any abdominal infection. Bowels regular. No gastric pain nor vomiting.

Genito-Urinary: No history of G. C. nor lues. No frequency of urination, burning, nor nocturnal urination.

Extremities: No paralysis, atrophy, ulcerations, injuries or tumor.

Skin: No rash, ulcerations, burns nor scaling.

Physical Examination: Eye: Paralysis of the right extersus rectus muscle. Squint of the right eye. Pupils not circular. Re-act to L. and A. No conjunctival anesthesia. Nystagmus.

Special Examination: Dr. Wendel.

Ears: No evidence of any suppurative condition, past or present. Patient has slight deafness, more marked on left.

Spontaneous horizontal nystagmus (with slow quick component) first degree to both sides. Nystagmus varies, at times becoming slightly wild and movements coarse. On rotation ten times, spontaneous nystagmus to side stimulated is increased, while to the opposite side, spontaneous nystagmus disappears for fifteen seconds. Nystagmus is not labyrinthine.

X-Ray Report.—Stereoscopic plates were made of head with right side down. There is a normal contour of the skull; mild exaggeration of the grooves for the blood vessels; normal appearance of the inner table with the exception of anterior fossae, where there is irregular thinning. We are unable to state the exact significance of this, if it has any. Slight thinning of posterior clinoids.

We would not state that any of these findings point to a cerebellar tumor, although at times with this condition there is atrophy of posterior clinoids. (Signed) Wm. H. Evans.

Dr. Frothingham, report of the eye, says:

Eye: 1. Convergent strabismus. 2. Lateral nystagmus. 3. Disc atrophic. 4. Vessels atrophic. Pupils dilated, did not react to light.

Report of eye examination December 5, 1917, through kindness of Dr. McClelland:

Right eye vision 20/20; left eye vision 20/20.

Fundus examination: Right: details of fundus seen very clearly. Disc appears slightly pale on temporal side. Margin sharply defined. Veins rather large and slightly distended. Arteries tortuous. No optic neuritis. No choked disc. No retinitis.

Left: Practically the same as right except disc does not show any difference in color between temporal and nasal side.

Spinal Fluid: Noguchi, negative. Reduced Fehlings. Cell count normal. Wassermann negative.

Blood: R. B. C., 5,600,000; W. B. C., 12,000; Hb., 85 per cent.

Blood Pressure: S. 130; D. 94.

Urine: 24-hour amount, 750 c.c.; amber color; acid reaction; specific gravity, 1,020; albumen, negative; sugar, negative; microscopical, negative.

Dr. Hitchcock's examination, at one time, revealed that the convergent movement of the eyeballs on accommodation was faulty inasmuch as the right eye did not follow beyond the middle line.

November 3, 1917.

Lying down: Spontaneous nystagmus first degree to right for 6 seconds. Spontaneous nystagmus first degree to left 55 and more seconds.

Repeated to right: 25 and more seconds. Both with short periods of rest.

Sitting up: Looking to left, nystagmus 70 and more seconds, patient gradually leaning to left.

Looking to right: 35 and more seconds, somewhat coarser and slower, also leaning to *left*.

November 4, 1917.

On tapping: Pain just below occiput, median line. When his head is turned back a "drawing in both arms as if they were too short." When tongue is pushed out, first drawn to left then adjusted to middle line.

November 28th, I examined the patient in my office and found the following: Patient says that he is always dizzy, and that his left leg is weak. Spontaneous horizontal nystagmus (first degree) still present to both sides. Nystagmus also when looking upward. Low fork 40, a, and 4,096 heard in both ears.

Acoumeter heard in a distance of over 20 feet in right ear, 29 inches, and

34.5 inches left side. Weber a' right. Whispered voice right ear (99) over 20 feet, (89) 16 feet, (98) 15 feet, (77) 12 feet. Left ear (99) 11½ feet, (98) 15 feet, (89) 9-10 feet, (77) 4-5 feet. Rinne, (128) right ear; bone conduct a little shortened; air conduct normal.

Left ear: Bone conduction shortened as in other ear; air conduction a little shortened, but still positive.

Says, "When it is hot in summertime, he feels a little dizzy in eye." Nystagmus (first degree) to right for 15 seconds, to left for over 20 seconds (observation discontinued).

He complains that he had pain in right parietal region when he became sick and that he had, while in the hospital, shooting pain in right parietal region, in right and middle occipital region, and in right eye.

He thought the eye would "come out."

Examination in turning chair sitting upright: When turned three times to left, feels dizzy, nystagmus (first degree) to left ceases for about 12 seconds.

When turned three times to right feels dizzy, nystagmus (first degree) to right stops for over a minute (observation discontinued). Both eyeballs move somewhat jerkingly up and down in first degree position, i. e., in extreme position looking right or left.

December 5, 1917, examined by Dr. Wendel and myself (in office). Nystagmus without turning:

To left: Quick and slow component.

To right: Sometimes a quick and slow component, sometimes even components.

Nystagmus much more marked when looking to left than when looking to right.

No nystagmus when looking straight forward, but nystagmus when looking upward.

After turning three times to right: Nystagmus to left of vestibular type, third degree.

After turning three times to left: Nystagmus to right, third degree. Pastpointing on turning.

Romberg: Falls to right.

Caloric Tests.

68° in left ear for 1½ minutes: nystagmus to left side a little less pronounced.

68° to left ear for 1 minute 20 seconds just the same.

106° to left ear: nystagmus to right and left not influenced even after 1½ minutes.

He still complains some days, about pain in right parietal region and right occiput.

January 18, 1918. Patient walks to the right when eyes are closed. Romberg negative.

Nystagmus: To left of changing type. At times it is fine, with even fast small components, then again it is of a vestibular type.

To right: Nystagmus is coarser and shows quick and slow components, yet the nystagmus, as a whole, is slower than on the left side.

Upward: Looking upward: Vertical nystagmus at times purely vertical, at times rotary.

At this time Dr. L. T. Crane, interne in Harper Hospital, established the following:

Before Vestibular Test.

(In the following descriptions the terms left and right, always refer to the patient's left and right—not to the observers'.)

1. *Eyes turned to the left*: Rapid, fine nystagmus at times. Occasionally a slower nystagmus with the quick component to the left.

2. *Eyes to the right*: Coarse, slow nystagmus, with quick component to the right.

3. *Eyes turned directly upward*: Nystagmus varies: (1) Sometimes there is a vertical nystagmus with the quick component upward. (2) Sometimes there is a rotary nystagmus.

4. *No vertigo.*

5. *No falling.*

6. *No pastpointing.*

After Vestibular Test.

1. *Rotated* 10 times to left, in 20 seconds: Head 30°. Nystagmus with quick component to the right for 36 seconds. Vertigo present.

2. *Rotated* 10 times to right, in 20 seconds: Head 30°. Nystagmus with quick component to left for 34 seconds. Vertigo present.

3. *Rotated* 10 times to left, in 10 seconds: Head 30°. Pastpointed to left 4 times with each hand.

4. *Rotated* 10 times to right, in 10 seconds: Head 30°. Pastpointed to right, 1 time with right hand, and 2 times with left hand.

5. *Rotated* 5 times to left, in 10 seconds: Head 90°. Patient fell to left but felt as though he were falling to his right.

6. *Rotated* 5 times to right, in 10 seconds: Head 90°. Patient fell to right but felt as though he were falling to his left.

January 23, 1918. The superintendent of the factory told me that several weeks before the sunstroke, he noticed one day, before patient applied for a permit, "that patient walked to one side as if he had been drinking, as if he had had two or three drinks too much." He did not want him to apply for a permit in that condition and wanted him to wait until the next day. Mr. A. in the office said that patient had not been drinking, but that he acted "as if dazed, stupid, like dopish, could not walk straight, that he was queer but could not express himself, impediment of speech." (Patient does not speak English well.)

July 31st, about 4:30 P. M., patient staggered, when working in yard, walked about 100 feet.

The superintendent asked, "Where did that man get his liquor?"

Somebody said that patient drank ice water all day. He was carried back to platform and Dr. McCormick called, who found him unconscious.

January 26, 1918. I saw patient at his house. He was in bed. Nystagmus still present, more marked to left (first degree).

When lying down, nystagmus to right (first degree) much plainer than when sitting up.

Patient complains only about eye and pain below middle of occiput in head (not in skin, where there is a thickening), and pain in right frontal and temporal region.

Patient says that the left side of his face feels worse than the right. The right side seems a little fuller. He claims that he never was dizzy except in the summer (1917) in hot weather, while working in the open. It is impossible at present to name the date when the superintendent saw him walking to one side, but it seems to be approximately at the end of May, or the beginning of June.

Patient says that he fell on the left side of his head two (2) weeks before the sunstroke.

These and the following symptoms have been established in numerous visits, partly by others, and partly by myself.

Symptoms which are or have been present:

1. Pain in right parietal region, in right and somewhat in middle occipital region, and in right eye.
2. Nystagmus.
3. Transitory abducens paralysis.
4. Fundus changes, right disc partially pale.
5. No double vision.
6. Field of vision: normal.
7. Double Facial paresis. Face appears a little mask-like.
8. Tongue, when shown first, deviated a little to left side, then adjusted to middle line.
9. Thick speech.
10. Adiadokokinesis right hand.
11. Weakness of right hand compared with left.
12. Absence of abdominal reflexes.
13. Exaggerated patella reflexes.
14. Motion in left leg uncertain.
15. Weakness in both legs.
16. Babinski positive on right.
17. Absence of tremor.
18. Static ataxia.
19. Walked distinctly to right.
20. Romberg: sways to right.
21. Labyrinths re-act.
22. Pastpoints on turning.
23. Moderate diminution of hearing in left ear, very little on right.
24. Wassermann negative.
25. Some symptoms noticed before sunstroke.
26. Patient claims that disturbance only since he worked in hot weather in the open.
27. Patient says that he feels better in summer when the weather is cool.

References.—1. *General.*

Prof. K. Koester, of Bonn (*Berliner klinische Wochenschrift*, August 23, 1875), reports the autopsy findings on a soldier who had died of heatstroke: Hemorrhage into the *ganglium supremum dextrum Sympathi*ci and swelling of the left to double its size (microscopically) pushing apart and destruction of nerve fibers: small hemorrhages in the lower, larger hemorrhages in the upper portion of the right sympathicus; smaller hemorrhages in and around both Vagi with swelling of these parts, and hemorrhages in both *phrenici*; hemorrhagic spots in the sheats of both carotid arteries in the lower portion of the neck; slight hyperemia of the brain, several very small ecchymoses under Ependyma of left ventricle.

Surgeon G. Douglas Hunter, "Notes on Heat Stroke" (*The British Medical Journal*, July 9, 1887, page 65) says:

"The average strength of the garrison for the month of June (1886) at Assouan was 2,469. The average number of constantly sick in the hospital for the month of June was 208. There were forty-five cases of heatstroke causing 24 deaths, and three cases among the officers, with one death. All cases that died in the hospital were of the hyperpyrexial type.

"The post mortem appearances were almost invariably the same; intense lividity of the surface, and one unfailing sign was the sub-conjunctival ecchymosis which left a dark stain, in some cases more extensive than in others, but always present after death.

Only a few brains were examined, and these presented general engorgement of the vessels, especially at the base of the brain. Case 6 showed meningeal inflammation. The internal organs were invariably engorged with blood, the venous system being overloaded, and the blood non-aerated. The heart was generally flaccid and full of blood. The muscles were dark colored. The majority of the cases did not result from direct exposure to the sun's rays, but occurred either in the shade of the barrack rooms, or in hospital, or at night."

Dr. F. A. Packard, "Report of Thirty-One Cases of Heat Fever Treated at the Pennsylvania Hospital during the Summer, 1887" (*Amer. Jour. of the Med. Sci.*, 1888, p. 554), says:

"The pupils in 24 of the cases were extremely contracted; in five they were natural; in one they were sluggish, while in one they were dilated. Where the pupils were contracted there was also present unconsciousness, except in three cases. Only two autopsies could be made. In one case the findings were, in part: The veins of the spinal dura and pia were full of dark blood and the substance of the cervical cord was congested. The membranes of the brain were much congested with an area of hemorrhage beneath the pia mater at the base over the pons and posterior perforated space. The arachnoid and pia were opaque, with white lines streaking the latter. In the other case there was a marked staining of all the tissues with bile, slight opacity of arachnoid and pia mater, etc."

Dr. Wm. W. Gannett, "Cases of Heat Stroke Observed in the Summer, 1892" (*Boston Medical and Surgical Journal*, April 20, 1893, page 881), claims that after recovery the patient should be warned of future exposure to high temperature." "Cases," he continues, "have been reported in which for a long period after heat stroke, headache and epileptic convulsions have occurred." These symptoms may, of course, be due to a meningitis or other cerebral disturbance caused by heat stroke. Inasmuch as the reported cases have done well under iodide of potash and not improved under other means, he cannot but feel that there may have been a syphilitic element in the cases.

Dr. Charles F. Withington (*Boston Medical and Surgical Journal*, May 23, 1895), says: "Unilateral spasm was occasionally observed." In a patient of Dr. Forster's there was noted "three minutes after death a slow bilateral rotary motion of the arms, beginning in the left and followed by the right."

Dr. Edward R. von Hofmann, in his "Textbook of Forensic Medicine," 1895, page 596, says: "Dittrich (*Zeitschr. f. Heilkunde*, 1893, XIV, 4th part) has made autopsies in twelve cases of heat stroke and always found ecchymoses on the endocard and epicard, also in the cranial coverings and in the lungs, rarely on the mucous membrane of the throat, and also almost always pathological changes of the heart which he considers a factor which favors heat stroke."

2. *Neurological.*

H. Oppenheim (*Textbook of Nervous Diseases*, page 903) says: "Some authors explain the symptoms of insolation by hyperemia of the brain; others by thrombus and multiple capillary hemorrhages in the medulla oblongata, etc., yet also anemia, edema of the pia, meningitis and finer changes in the cells have been found respectively surmised. The clinical symptoms of the so-called heatstroke are quite varying. For instance, increase in temperature, headache, mental disturbances, loss of consciousness, respectively, deep coma with considerable rise in temperature, paralysis of a paraplegic or hemiplegic character, disturbances of speech, ataxia, etc."

The same author, *loc. cit.*, p. 740, writes: "It must be remembered that Deiter's nucleus forms the junction of various fibers. The N. vestibularis ends in it and a connection exists between the nucleus and the cerebellum. It also furnishes an interruption station for that bundle of fibres which goes from the nucleus ruber to the anterior lateral column of the spinal cord (Monakow's fibres). One also has reason to believe that it sends out fibres which go, in the posterior longitudinal tract, toward the cerebrum to the nuclei of the eye muscles. The importance of the labyrinth for the maintenance of the equilibrium, the influence of the same upon the eye muscle apparatus, are explained by these anatomical revelations, also the manner in which the cerebellum may regulate the mechanism of the movements of the head, of the trunk, of the extremities and probably also of the eye muscles."

Alexander Lambert, in the Reference Handbook of Medical Science, under "Heat Stroke; Pathological Anatomy and Pathology," says in part:

"The meninges of the brain are congested, and there is more or less abundant subpial fluid. The brain itself is usually firm and not congested, with sometimes a little bloody fluid in the ventricles. The membranes of the spinal cord are congested, the cord being firm and about normal in appearance. In the minute cellular structure of the brain we find changes which are much more constant and which are fairly characteristic.

"Dr. Ira Van Gieson has described these lesions in the neurons of the brain and cord, as an acute parenchymatous degeneration of the ganglion cells best shown by the Nissl stain and counterstain with eosin. The appearances seem to be more often found in the anterior horns of the spinal cord where the changes do not seem to have advanced so far as in the cerebral cortex and cerrebellum."

Under complications, Lambert mentions that meningitis and encephalitis are not uncommon complications. Delusional insanity with ideas of persecution and hallucinations of various kinds are frequently observed.

Lambert concludes his article by saying that it is remarkable how long the sequelae of sunstroke may persist and that it is often years before exposure to heat can be withstood without recurrent headache and prostration.

Fayer mentions that cerebral hemorrhage may follow sunstroke. "Chromatopsia may occur on hot days."

Dr. Henry Jackson, "Insolation," *Boston Medical and Surgical Journal*, January 28, 1897, page 101, says: "In case IV, the boy, the clinical symptoms strongly suggested some pathological process in the meninges, and the autopsy confirmed the clinical diagnosis, showing that the disturbing factor was an extensive edema of the pia when the calvarium was removed the brain looked like covered with a thick layer of wine jelly." In the discussion, Dr. Buckingham (page 113), referring to the post mortem, says: "When the top of the skull was removed there was no sign of any convolution, the appearance was like that of a jelly-fish. The post mortem stopped at that point, some twenty minutes, during which there was a steady patter of clear serum upon the floor, after which the brain resembled brain."

The *British Medical Journal*, of September 15, 1900, page 764, under "Sunstroke and Heatwaves," says:

"The term 'sunstroke,' moreover, like the French *Coup de soleil*, and the German *Sonnenstich*, is a somewhat unfortunate one for ordinary use at the present day, inasmuch as the condition it is meant to signify may occur independently of the sun.

"Many people during seasons of hot weather and particularly during the insurgence of heat waves manifest an irritability of temper with a degree of motor restlessness which are annoying to their friends, and a loss of appetite, insomnia, and a disinclination for exertion of any kind which are distressing to themselves. More alarming, however, is the sudden faintness or giddiness followed by a dazed feeling, which sometimes occur during actual exposure to the sun—a condition which, if it be not usually dignified with the name, is probably a minor degree of sunstroke."

3. *Otological.*

Barany, "Functional Testing of the Vestibular Apparatus," translated by Irving Wilson Voorhees, *Annals of Otology, Rhinology and Laryngology*, March, 1912, says:

"A nystagmus of high degree existing for a long time unchanged is always of intracranial origin. I believe that such a nystagmus is not due to constant irritation, but depends upon destruction of certain parts of a nucleus, which in turn produces uninhibited function of antagonistic cell groups. Moreover, there may be transitory paralyses which likewise improve with the receding disease, as observed in cerebellar abscesses. Frequently, however, there remains, even after healing up of the lesion, the previously existent central nystagmus, as I have seen in two operated and healed acusticus tumors, the slow growth of which usually reduces the transitory paralysis to a minimum when hydrocephalus is not combined with the tumor."

Rosenfeld, in his monograph, "The Vestibular Nystagmus and Its Significance for Neurologic and Psychiatric Diagnosis," 1911, page 36, under "The Vestibular Nystagmus in Multiple Sclerosis," claims that, "In multiple sclerosis a lively, coarse nystagmus is regularly created by calorization and by a few turns. Only exceptionally this is not the case. If there exists a spontaneous nystagmus, *e. g.*, to the right, it is always suppressed when the right ear is calorized. "Cassierer and Loeser previously have pointed out that spontaneous nystagmus is suppressed to the side of turning after a few turns around the vertical axis."

4. *Ophthalmological.*

Dr. F. C. Hotz ("Notes on Intra-Ocular Lesions Produced by Sunstroke," *The Am. Jour. of Med. Sciences*, 1879, page 105) says:

"Among a great number of cases of atrophy of the optic nerve we occasionally meet with a patient who traces the beginning of his eye trouble back to an attack of sunstroke. The ophthalmoscope reveals a white or bluish-white papilla with thin arteries and often pigmented outlines."

Hotz reports seven cases and says: "These cases show a most significant similarity. After recovery from the immediate shock, they suffered from a violent headache for several weeks, sooner or later their eyesight began to fail, and in all cases optic neuritis and peri-neuritis was found as the pathological conditions of the eyes so affected. The clinical facts, Hotz says, show pretty conclusively that the neuritis is a secondary affection, resulting from a primary lesion produced by the heat within the cranial cavity. Pathologists agree that we generally find a marked congestion of the sinuses and nerves; sometimes a sanguineous effusion between dura mater and cranium; a certain quantity of serum at the base of the brain; and the gray substance more or less hyperemic. Schwalbe has established the fact that the sheaths which envelop the intraorbital portion of the optic nerve must anatomically be considered as direct continuations at the meninges, etc."

Dr. L. A. W. Alleman (*N. Y. Med. Jour.*, May 5, 1888, page 489, in an article, "The Papillitis of Sunstroke") says:

"To account for the ocular trouble, it seems by far the most probable hypothesis to assume that this same disturbance of the nervous system which produces the general symptoms—such as nausea, vomiting, headache, giddiness, numbness and convulsive movements—extends at the same time to the vasomotor apparatus of the eye, and then manifests itself as thât nutritive disturbance which we recognize as papillitis; or as Pagenstecher puts it, 'the irritation conveyed through the nerve tract of the sympathetic to the disc induces the change of the nerve fibers, the hyperemia, and even the development of new vessels, and in this manner a swelling and obfuscation of the disc and the adjacent parts of the retina are brought about.' "

Dr. Jams A. Spalding, "Is Vision Ever Permanently Affected by Sunstroke?" (*The Medical Record*, April 28, 1888), says: "It is my opinion that insolation rarely affects the sight permanently, and, if so, that the results in the form of optic atrophy ensue within a few months, never, as the innumerable pension claimants assert, at any interval extending from four to nineteen years later."

Dr. F. A. Tuttle, "Vision Permanently Affected by Sunstroke" (*The Medical Record*, June 16, 1888, page 664), says: "In June, 1863, while in charge of a picket line as medical officer, I became insensible from sunstroke. The first time I saw light was on the third night. I slowly gained my sight. I had to give up general practice as on going from the out-door light into a room, it takes from 15 to 20 minutes to adjust itself. My vision now is fairly represented by looking through two tubes one inch in diameter. No angle of vision has ever returned. I am completely night-blind. Experts say that there is atrophy of the retina. As to blindness coming on ten or twenty years after sunstroke, I must agree that it is extremely improbable."

Dr. A. R. Baker ("Impaired Vision as the Result of Sunstroke," *Journal A. M. A.*, 1889, Vol. XIII, page 802) says that most articles mentioned sunstroke as one of the causes of atrophy of the optic nerve.

Baker places five cases on record in which vision was impaired. Case 1, Mr. H. M., 39 years old, sunstroke while in service, July, 1864. Partial white atrophy of optic disc; field of vision very much contracted, vision left eye 20/30 (Snellen); right eye 20/40; refraction normal.

CASE 2. Farmer, age 65, examined August, 1887. Sunstroke June, 1864. Suffered from constant headache, confined to right side of head. This side of head always more or less tender on pressure, mind not very clear, prematurely old; slight paralysis of left side of body; dragging of left foot in walking; cannot bear heat of sun, always carries umbrella when sun shines. Complete white atrophy of outer half of optic disc of left eye and inner half of right optic disc, left lateral haemianopsia; vision left eye 20/100, right eye 20/100 (Snellen).

CASE 3. Mr. J. T., 45, complete white atrophy of the optic nerve of left eye. Veins are large and arteries very small. The blood vessels about the disc are very tortuous, showing previous intense neuritis. Partial white atrophy of the right optic disc. Blood vessels somewhat tortuous, but not so much as in the other eye. Vision left eye, slight perception of light; right eye 20/150 (Snellen).

CASE 4. Dr. T., 57, (see before). Field of vision extremely limited. White atrophy of both optic nerves. Field of vision only about 2 inches in diameter at a distance of 12 inches. Vision right eye 20/100 with 2 D C axis 90=20/60 (Snellen). Vision left eye 20/160 with 2 D C axis 90=20/100.

These four cases are all old soldiers.

CASE 5. A merchant. Sunstroke July 4, 1886. Examined August 5th, same year. Headache, dizziness, nausea, occasional diplopia and dimness of sight. Optic neuritis in both eyes. Outlines of the disc could not be distinguished. Veins large, arteries small. Vision right eye 20/40; left eye 20/60 (Snellen). Refraction normal. At present no appreciable atrophy of optic nerve, a slight tortuosity of blood-vessels. Vision 20/20 in either eye.

Dr. P. F. Atkey (*The Lancet*, England, 1896, page 923) reported a case of severe heatstroke. Pupils slightly contracted and not acting to light (recovery).

5. *Biochemical.*

Dr. Ira Van Gieson, "Pathology of Insolation" (*Medical Record*, June 30, 1900, page 1134) says:

"It seemed to be a good example of an acute poison originating in the body, and acting most violently on the nervous system, particularly on the ganglion cells which governed the heart and controlled the vasomotor apparatus. The delirium, convulsions, opisthotonos and the mental derangement, etc., could be at least partly interpreted by a poison of autogenous origin."

Dr. Geo. J. Brown "Typhoid Peculiarities Following Sunstroke," (*Jour. A.*

M. A., XXXIV, 1900, page 509) noticed a peculiar type of delirium in patients who had suffered from sunstroke and asks:

"I desire to know whether insolation leaves any lesion of the brain, that renders it susceptible to the typhoid toxin causing that peculiar type of delirium?"

Dr. R. B. H. Gradwohl and Dr. Edwin Schisler ("A Study of Thermic Fever with Special Reference to the Blood and Urine Chemical Finding," *Amer. Journal of the Medical Sciences*, Sept., 1917, page 407, etc.), write:

"We found in the blood-chemical analyses of these cases high retention of the non-protein nitrogen constituents, indicating clearly a deficiency of renal function. In some cases the retention was high and the symptomatology not bad, yet the cases died. In other cases we found low retention and bad symptoms, and the patients uniformly recovered.

"Thermic fever can be added therefore to the set of conditions which with high creatinin value, 5 mgm. or over (per 100 c.c. of blood) can be said to offer a fatal prognosis. For all intents and purposes the figures in thermic fever may be construed as similar in their interpretation to those obtained in severe uremic nephritis."

Conclusion.

The picture is protean, changing and obscure. It is not impossible that the patient suffers from changes previous to those caused by the insolation on July 31st. The changes may be similar to those which cause multiple sclerosis. On the other hand, the picture resembles that found in disturbances of the central nervous system of a different nature.

Patients suffering from insolation should always be examined from the biochemical, neurological, ophthalmological and otological standpoint. The consideration of the various degrees of insolation is important. It must be remembered that patients who have once suffered from insolation are predisposed.

I do not claim that this report is complete, nor do I insist that the diagnosis, "insolation," is the correct one. Nevertheless, I thought it worth while to report this case because it offers such a complicated complex of symptoms and because the report may throw additional light on the subject-matter in spite of its shortcomings.

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THE RELATIONS OF VARIOUS COURSES OF LIFE TO INSANITY.

By

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NOT ONLY among the laity, but with "family physicians" and specialists in the numerous departments outside the domains of psychology and neurology, there exists even now a discouraging lack of interest in regard to mental diseases and their burdens. In the meetings of county, state, or national associations, a careful perusal of the programs will show that very little space or time is given to articles on insanity. And a pitifully small number of medical journals are devoted to this subject, and all the others usually conceal any interest they may feel. The same may be said of popular educational lectures. Perhaps this is due in part to a dry and unduly technical form of expression. Even books on mental hygiene are too often dry as dust, whereas the subject can and should be made not only "interesting and instructive," but also attractive and readable.

Fortunately for our country, the government has initiated the proper methods of examining the mental condition of all who are or will be selected to defend and protect us. This is wise, and its value is appreciated by all the allied nations engaged in the present great war. But it is not as important to interest and protect the immensely large majority of us who can only "stand and wait," of course, doing our part in furnishing the sinews of war, both financially and morally? Even one insane or defective person is a drag on the wheel. Do you realize that there are to-day in our institutions over two hundred thousand insane or feeble-minded, and if we could ascertain the number who are cared for outside hospitals, we would find that the proportion to population would be one to every four hundred, at a very conservative estimate? And this does not include the criminals, many of whom are, to put it moderately, of more or less unsound minds. And can we doubt the importance and necessity of a concerted campaign on the part of the medical profession and the laity against this burden?

I cannot recall the author of the statement that "though the scientists may be the only ones nowadays who have anything to say, they are also the persons who cannot say it"; but, like all other aphorisms, it is only a half-truth. Since writing the above sentence, I have carefully perused the tables of contents of one journal devoted practically to insanity and out of 52 articles 18 were so long, so full of statistics, with description of illustrative cases printed in such small type that one's eyes soon became weary, and often with unnecessary verbiage; that it would require the patience of Job to read every word. There were a few other articles which did not appeal to me, while the remainder were of immediate value. Three articles were very long—67 to 82 pages. Please do not think that any of these articles were devoid of merit and interest. Far from it. But their chief value was statistical. And when one thinks of the vast number of journals—foreign and native—one sometimes is disheartened, since the regular daily duties demand some time. Let me add that every physician who is now on the staff of any hospital, or has been, and every psychiatrist in the world, is constantly aiming to prevent mental disorders when possible; to hasten recovery by early treatment; and to prevent deterioration in patients who do not recover. Their watchwords are prevention and humanitarian care, and they have already elevated the standard of administration to the highest possible station. And they will be only too glad to advise or instruct anyone—layman or professional—who appeals to them.

While the proportion of doctors who become insane is exceedingly small, it is a well-known fact that *some* physicians follow courses of life which do not promote mental health, and hence it is pertinent to recall and emphasize the fact that they should sometimes "stop, look, and listen." They can say with Ovid,

"I see the right, and I approve it too;
Condemn the wrong, and yet the wrong pursue."

In what follows, what I shall offer may, and in many cases will, seem to be the most trite of platitudes, especially to the highly educated, but they cannot be omitted or neglected. There is not much that is really new. What seems new—I am speaking of mind, which really means conduct, is old, as far as general principles are involved. The basis and structure of all moral, mental, and physical sanitation was well understood by the ancient Hebrews, as recorded in The Third Book of Moses, called Leviticus, the Proverbs, and Ecclesiastes. It would be well for all to carefully read these books, with their minute details, regardless of their theological views. We are too apt to neglect the old in the desire to find something new. And how often nowadays we find very intelligent people not only sneering at the efforts to promote health of mind and body, but opposing them. Take this slur from a leading metropolitan paper: "Pity the Poor Soldier! Defective ammunition is bad enough, but why should the War Department further afflict our warrior sons by wishing on them a plague of psychologists?" If the psychologists have given their invaluable services, at a great sacrifice of time as well as income, to see that our heroes are not only fit to fight, but also to maintain their mental as well as moral integrity and efficiency by never straying from the right paths, it is a crime to say or do anything which will hamper their energy or lower their honorable zeal. Many of my friends are engaged in this noble work, and only my age prevents my participation.

The alcoholic route to insanity is a broad way "that leadeth to destruction, and many there be which go in thereat." Unimpeachable data from hospital records show that from fifteen to seventeen patients out of every hundred admissions owe their insanity solely to alcohol, while in at least thirty more, it is one of the indirect causes. Among the former we include several psychoses—namely:

A. Pathological intoxication.
B. Alcoholic deterioration.
C. Delirium tremens.
D. Korsakow's disease (polyneuritic psychosis).
E. Acute hallucinosis.
F. Chronic hallucinosis.
G. Acute paranoid form.
H. Chronic paranoid form.
I. Other less definite types, which sometimes occur.

In some of the above recovery usually occurs on the complete withdrawal of alcohol and prompt and proper treatment. I refer to classes A, C, E, and G. But total abstinence for life is the only way to obtain immunity.

As several successful physicians have been under my supervision for alcoholism, it will not be out of place to emphasize a few points which everyone knows, but too often disregards. Alcohol is a narcotic poison. It does not help us to bear excessive heat or cold, or any mental or physical burdens. It does not steady our nerves or strengthen our muscles. It may, like a whip or spur, call out our reserve strength, but it does not impart any new power. A very small amount of alcohol is burned up in our bodies, but its food value is not only exceedingly small but adds immensely to the high cost of living. And from my long experience, confirmed by a host of the best authorities, in all lands, I am sure that it is neither desirable nor necessary as a "medicine." In the best hospitals its internal use has been practically discontinued, better and safer substitutes being employed, Jacobi and others notwithstanding. Unfortunately, in my opinion, unlike some other poisons, alcohol does not kill quickly, but usually enables its habitues to drag out a wretched or more or less inefficient existence for many years.

The "drug route" surpasses Saul or David in the number of its victims, and the resultant horrible and terrible hallucinations and miseries are so numerous and varied that even Dante or De Quincy would, if alive, be obliged to strain to the uttermost their powers of description to depict them. One cannot name them all here, but we may allude to opium and its numerous devilish derivatives and to cocaine; while among the substitutes are ether, cologne, "Jamaica Ginger," and the many patent medicines which almost, if not always, contain a large proportion of alcohol. To-day, when I am suffering from a severe "cold," a relative sends me a "sure cure" for my intractable cough, which contains a large quantity of opium and alcohol. That is a crime. Even though the exact quantity of poison is clearly printed on the label, many are too ill informed to realize the danger. I have been called several times to treat people who nearly died from over doses of these abominations. And I am sure that Mother Winslow's Soothing Syrup has in many cases produced an endless sleep, and, inadvertently, of course, increased the emoluments of undertakers. Most of us expected that the stringent laws for the registration of all qualified physicians would result in the complete elimination of quackery, charlatanism, and all the other humbugs which infested the world, but the reverse is the case. Never within my recollection have there been so many patented "cure-alls," so many fakirs, so many victims, and so many fortunes made by exploiting the misfortunes of the unsophisticated or ignorant. Some quacks lay great stress on the fact that their "medicines" are "purely vegetable, containing no minerals," whereas the community should know, or be taught, that the deadliest poisons are vegetable or animal—prussic acid and cobra venom, for example.

Although, as said before, a few physicians pursue drug routes, even they, with the immense majority of physicians, are united in condemning and warning against them. Nowadays we are placing less reliance on drugs, valuable as these are when properly administered at the proper time and in the proper way, and depend on vaccines, antitoxins, baths, and other resources which need no description. But there are two other drugs which need more cautious and careful use, as baneful results may appear. I refer to quinine and the bromides. No one should ever take either of these except in such doses and periods as prescribed by a doctor, who in turn should from day to day and hour to hour watch the patient's reaction to them. I formerly used the bromide in epilepsy, but in given cases the extreme mental degradation which ensued was alarming. This subject demands more space than at my disposal here. Let me emphasize one point, however. The victims of some of the drug habits, especially opium, cocaine, and heroin, suffer the most horrible pains and discomforts—mental as well as physical—and will do anything, from robbery to murder, if necessary to secure a supply of their special drug. And a larger number than most of us realize combine two or more of these poisons. It is our duty to teach the community, and never remit our efforts for a single day. Someone has said that Satan never lets up on his job day or night, and neither must we. Hospital statistics thus far show that drug habituation accounts for about one per cent. of admissions, but there are other mental degradations other than actual insanity which perhaps are fully as important.

Another course of life which often leads to insanity is the abnormal sexual route. Syphilis is the leading factor, accounting by almost universal consent for all cases of general paresis, and forming a decided feature in the etiology of other psychoses.

This matter is too familiar to require further consideration here. Sexual excesses and impurities have been described and condemned by the wise men of all ages. If one of the Psalms is any criterion, one might reasonably infer that David had practical experience. While there are some innocent victims of syphilis, many more acquire it through morbid curiosity or unwillingness to take advice. It is a bad course.

Another undesirable if not absolutely dangerous course of life, from which even physicians are not exempt, is what may be called living constantly under high pressure—burning the candle at both ends and sometimes in the middle as well. An excessive display of energy, exclusive devotion to one's vocation, the incessant demands imposed by the so-called "high society," with its late hours, inadequate periods of rest and sleep—turning night into day, over-eating, etc., tend to premature exhaustion of both mental and physical resources. Fortunately most of the wealthy conserve their strength, and the slaves to fashion are in a small minority, which is nevertheless still too large, and accounts for the increasing number of sanitaria and "rest cures," and health schools, and Muldoons. If one can believe what the papers report, even our strenuous Roosevelt has recently found it essential to abandon his wonderful activities and reduce an undesirable embonpoint. In a word, excessive absorption in either work or play certainly is bad for the average man. Although Edison has worked—so it is reported—eighteen hours a day for many years, and is still robust, efficient, and productive, only disaster would result if the most of us tried to follow his example. My point is this—what really everyone knows—that while unquestionably a few cases of insanity are largely due to overwork—its baneful effects are more frequently to be found in various degrees of breakdowns, which impair mental as well as physical efficiency.

Those who overwork usually look forward to a period of life when they can retire and enjoy themselves. But what happens then to the too large number who have never cherished or have deliberately abandoned any and all the varied forms of wholesome recreations and interesting hobbies, which would have afforded much needed rest and true relaxation? Unquestionably many of these develop a senile psychosis, as history and hospital statistics show. Those who escape this may and often do find that when circumstances force them to abandon their wonted activities, they have no resources for the proper utilization of their enforced leisure. Books, music, painting, sculpture, travel, nature—in short, all the arts and graces and beauties of life, are closed for them. They are reduced to petty gossip, idle and aimless wanderings, long, listless and weary hours—an end almost worse than complete mental shipwreck. Darwin is a horrible instance, while Gladstone, who in his extraordinary amount of superior work always had time for omniverous reading and chopping down trees, was bright and animated and cheerful and serviceable to the very end. These exceptions vindicate the old proverb—*in medio tutissimus ibis.*

Another unfavorable course of life is that of the idler—the man who has no special aim in life but to shirk all work, and even play which requires any exertion of body or mind. Satan usually finds some mischief for his idle hands. I once had the care of a man of this stamp. After daily efforts for two years to arouse in him a determination to engage in some form of occupation, even if only to wipe dishes, he finally said: "I work all day, and you know it. Sometimes I sit here and think, and sometimes I am just considering." But eventually my perseverance was successful, and for years he took the whole charge of four tables in the congregate dining-room. Josh Billings said of loafers, "they help count in an epidemic." But I do not think that they help much even then.

Other undesirable courses of life are those characterized by selfishness, greed, willfulness, obstinacy, narrowness, self-conceit and ambition. Nothing is more unlovely than selfishness—"a dog in the manger" habit: it promotes greed and narrowness. A lofty and noble ambition to make the most of one's talents in order to render better service to the world, is commendable. I refer here to the desire for pre-eminence with due regard for the rights and privileges of others. There is an impassable gulf between Washington, who only drew his sword in defense of his country, and when that was saved, laid it aside, and Alexander, miscalled the Great, who "wept because there were no more worlds to conquer." As for self-conceit—a far different thing from a decent self-respect—it is odious to behold, and vicious to maintain. Some one has said that "X is a self-made man, and worships his creator."

A famous Englishman said of a famous American—names withheld—"He shouts the eternal verities through a megaphone." But this is necessary in this busy world, with its rush and turmoil and nervousness. Unrest was never so prevalent as now, when the great war has stirred all nations, directly or indirectly, and will test the power of us all to control and discipline our emotions, exert our judgment intelligently, and maintain our minds and bodies in a healthy and normal condition. There is no doubt that the war will directly increase the number of insane, to say nothing of boundary land cases, and therefore it is imperative that psychiatrists should take concerted action to minimize this affliction. In fact, they have already begun, but they will need assistance. Let us all then do our bit.

We are taught that when the cause is removed the cure is effected, and this has been demonstrated in the case of typhoid, malaria, yellow fever, and so on. There is no doubt that we could exterminate general paresis, the alcoholic and drug psychoses, if we could abolish syphilis, alcohol, and poisonous drugs. By inculcating and applying eugenics and mental hygiene to the highest degree we could largely reduce the number of cases of infective-exhaustive and manic-depressive psychoses, senile insanity, and even dementia praecox. And in a similar way we can limit all degrees of feeblemindedness. In fact some of us can vision the possibility of curing or even preventing all the varied forms of mental aberration and inefficiency. The inventive power of man has not reached the end of its possibilities. They are not limited to the aeroplane or submarine or wireless telegraphy. I remember how people sneered at Tennyson for his vision of "navies grappling in the central blue," but he could laugh now, if he were living. Just as the mind and body must co-operate all the time in order to attain and maintain normal conditions, so must all the nations of the earth unite in every good work. No one is so insignificant that he cannot give a mite at least.

Others, more competent, can outline and explain the more intricate problems of pathology and etiology as well as diagnostic procedures, and my efforts have been directed to supplement their articles by a synopsis of some of the conditions which tend to promote mental diseases, and which may help those who are not specialists, but are members of the general medical and also the legal profession. In educating the public or the family physician, and in treating the many cases which have been under my care, I have formulated a plan which has been fairly successful. Here it is.

1. Explain the normal reactions and functions of the body.
2. Outline the bodily conditions which lead to disease or degeneration.
3. Describe in clear and untechnical language the mental faculties, as now accepted by most authorities, viz.: perception, apperception, attention, orientation, consciousness, memory, thought, judgment, capacity for work, emotions, and will.

Regarding the latter, first give the average development and quality of these faculties which are indispensable to maintain a sound mind, and enable the individual to cope with the demands of modern civilization, maintain mental efficiency, and use it properly. Secondly, explain the causes of insanity as far as known. And then recount the symptoms of the varied psychoses. Finally, outline the modern methods for the maintenance of mental integrity, and the mode of prevention.

This work demands patience, perseverance, optimism, enthusiasm and determination, but it brings its own reward. Perhaps the method advocated by Persius, as quoted by Montaigne, covers the whole subject. It has been an inspiration to me, and I pass it on.

> "Think what we are, and for what end designed;
> How we may best thro' life's long mazes wind;
> What we should wish for—how we may discern
> The bounds of wealth, and its true uses learn;
> How fix the portion which we ought to give
> To friends, relations, country—how to live
> As fits our station; and how best pursue
> What God has placed us in this world to do."

208 Eastern Promenade.

THE RELATION OF THE EYE TO NERVOUS DISEASES.

By

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THE examination of the eye gives much information of value in nervous diseases. It is best to consider this relationship under three headings:

1. The physical signs within the pupil.
2. The physical signs without the pupil.
3. The reflexes of the eye.

The physical signs within the pupil relate wholly to its size and shape; thus a pupil may be contracted, dilated, unequal, irregular, or fixed. There are technical names which describe each one of these conditions. The contracted pupil is called miosis, a synonym being pinpoint pupil. It is diagnostic of apoplexy, meningitis, cerebral tumor, and abscess. The dilated pupil is called mydriasis and is diagnostic of all the syphilitic conditions and some drugs. Inequality of the pupils is called anisocoria. The inequality refers wholly to the corresponding size of the two pupils and has no regard to the reaction, the regularity, nor to the outline. It is especially common in neurologic conditions such as syphilis and alcohol. Irregularity of the pupil means confusion as to outline, that is to say, that the pupil no longer describes a circle or an eclipse, but is broken in outline; thus a pupil may be unequal but still regular, the two conditions are wholly distinct. Immobility of the pupil is a condition in which there is failure to respond to light. The light reflex is lost, due to a break in the reflex arc of the pupil, just as the absence of the knee jerk is due to a break in the reflex arc of the knee. There are various degrees of immobility, from complete to mild sluggishness. The immobile pupil is particularly characteristic of syphilis and is therefore a leading sign in paresis, tabes, and locomotor ataxia. Of these five signs which occur within the pupil, three of them are especially diagnostic, and characteristic of a pupil occurring in and resulting from a syphilitic infection. These three conditions are inequality, irregularity, and immobility.

The physical signs which occur outside of the pupil are much more numerous. The first one is that known as opthalmoplegia, which indicates a paralysis of certain muscles of the eye, namely the external muscles of the eyeball which are supplied by the third, fourth, and sixth nerves, and the muscles of the iris. Ophthalmoplegia may be acute or chronic, single or double. It occurs in toxic, apoplectic, meningitic, traumatic and degenerative conditions. It may also be present in new growths.

The second physical sign outside of the pupil is optic neuritis. This consists of a swelling of the optic disc which becomes gray, striated, and blurred. It is midway between papillitis and choked disc. Optic neuritis may affect either or both eyes; it may advance rapidly or slowly, and develop early or late. It occurs in many conditions, but is especially diagnostic of intracranial pressure and is therefore a common symptom of brain tumors and abscesses. It may also be a symptom in toxic conditions such as alcoholism, lead poisoning and meningitis.

Optic nerve atrophy occurs frequently as one of the physical signs outside of the pupil. It is a degeneration of the optic nerve with complete loss of color, loss of vision, and atrophy. It may be primary or secondary. Primary atrophy is usually the result of syphilitic conditions or new growths, whereas secondary atrophy is more apt to be the result of apoplectic and traumatic conditions.

Ptosis means drooping of the eyelid and is the direct result of paralysis of the third cranial nerve. It is usually accompanied by double vision, dilatation of the pupil, together with both loss of the light reflex and the power of accommodation, and divergent strabismus. The causes of ptosis are numerous, the most important being syphilitic, traumatic, and toxic.

Another sign occurring without the pupil is diplopia, which means double vision. Diplopia is due to the fact that the images of the object fall on non-corresponding fields of the retina. It is caused by a paralysis of certain eye muscles and is especially diagnostic of syphilitic and alcoholic conditions. Diplopia is a symptom of paralysis of the third, fourth, and sixth nerves.

Nystagmus means oscillation of the eyeball. The direction of these oscillations may be either lateral, vertical, or rotatory. The condition is nearly always bilateral. The best illustration of nystagmus is that afforded by a person riding in a moving train. Here the eyes, in their effort to follow the rapidly moving objects, oscillate constantly from side to side. The condition may be due to certain toxic conditions, certain occupations such as mining, certain degenerative diseases such as sclerosis; or it may be physiological as when it is due to irritations of the inner ear by alternate hot and cold irrigations. The symptoms are especially diagnostic of multiple sclerosis, and Friedreich's ataxia.

An important physical sign without the pupil is that known as conjugate motion of the eye, that is, the two eyes move together, either up or down or laterally. It is maintained by many that in irritative lesions of the brain the patient looks away from the lesion, whereas in destructive lesions of the brain the patient looks toward the lesion.

Hemianopsia, another sign without the pupil, means absence of one-half of the field of vision of each eye. Thus, there may be a blindness of the two outer halves or a blindness of the inner half of one and the outer half of the other eye. The condition is due to organic and toxic conditions but most frequently to the former.

Scotoma means a blind spot. It occurs in organic diseases of the optic nerve, in tobacco and alcohol poisoning, and in mulitple sclerosis.

Hemeralopia is day blindness, a condition which occurs in toxic conditions, especially nicotine poisoning and results in a patient being able to see better in a dim light.

Von Graefe's sign is one in which the patient's upper eyelid does not follow the eyeball when looking down.

Stellwag's sign is a widening of the palpebral fissure together with a decrease in the frequency of winking. Both of these signs occur in Grave's disease.

The reflexes of the eye are four in number, viz.:

1. The Argyll-Robertson reflex.
2. The Consensual reflex.
3. Wernicke's Hemiopic Pupillary Reaction.
4. The Ciliospinal reflex.

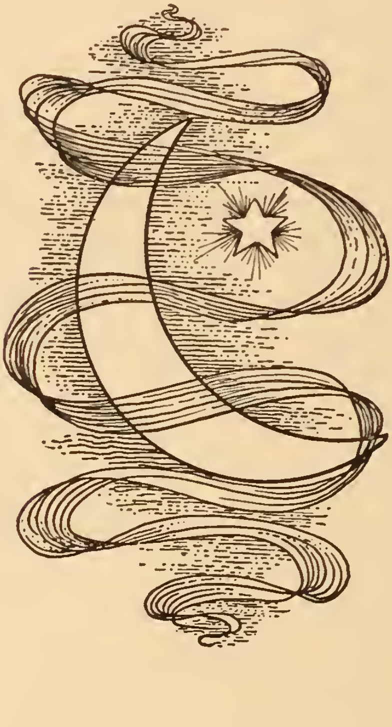
The Argyll-Robertson reflex is one in which the pupil fails to respond to light but does respond to accommodation. It is due to a break in the reflex arc. The condition may be single or double, pronounced or incipient. An incipient Argyll-Robertson pupil may precede a pronounced one by several months or years. The condition is especially common in syphilis of the nervous system, in disseminated sclerosis, in cerebral softening or atrophy, and in hydrocephalus. In syphilitic conditions it occurs in 95 per cent. of the cases and is especially common in locomotor ataxia.

The consensual reflex is one in which the reaction to light occurs in one pupil as a result of throwing light upon the other pupil. Failure on the part of a pupil in either eye to respond is evidence of a deficient light conduction.

Wernicke's hemiopic pupillary reaction occurs in hemianopsia. It is present when a ray of light is thrown on either half of the retina without a corresponding contraction of the pupil.

The ciliospinal reflex is the least important of the four. It consists of a dilatation of the pupil resulting from stimulation of the skin on the corresponding side of the neck.

41 East 63rd Street.



VAGOTONIA.

By

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ONE of the latest and an important advance in neurology has been the separation by distinctive description of the *vegetative nervous system* and the discovery of new facts in the physiology and symptomatic disturbance of its two sub-divisions, the sympathetic nervous system and the autonomic nervous system. Much of the credit for this work is due to Heinrich Higier of Warsaw and to Eppinger and Hess of Vienna. To understand the clinical condition *vagotonia* we shall have first to get a general idea of the results of the recent investigations of the vegetative nervous system.

The vegetative nervous system is an outgrowth of the cerebro-spinal system and on all of its fibres are ganglion cells. The vegetative nervous system is distributed to the non-striated muscles of the body, the pupils, various glands and viscera, the heart, the blood-vessels and the genital organs.

There are certain reflexes connected with the vegetative nervous system, such as salivation, sweating, flushing of the skin and the genital reflex; also others, as disturbance of certain hollow organs, for instance, the stomach, uterus or bladder, through fear, pleasure or surprise. Referred visceral pains, hunger, nausea, the feeling of satisfaction upon emptying the bladder, are also experienced through the vegetative nervous system.

Pharmaclogical experiments have shown that adrenalin is a drug which acts only on the *sympathetic* division of the vegetative nervous system, and it does so by stimulation. A depressant agent for these sympathetic fibers is not yet known, although morphia does depress their nuclei situated within the central nervous system. It has also been found out that pilocarpin and certain other drugs stimulate the *autonomic* system, while atropin, especially, depresses it.

The sympathetic division has been best known in the past and its anatomy is more or less familiar. All of the fibers of the vegetative nervous system not included in what is known as the "extended vagus" compose the sympathetic system. In the discussion of vagotonia we do not deal directly with the sympathetic division but with the autonomic division of the vegetative nervous system. We must bear in mind, however, that in stimulation of the autonomic system there is more or less compensatory depression of the sympathetic division. The sympathetic and autonomic divisions inervate together and balance control. Purves Stewart likens this antagonistic action to that of a pair of reins. Thus the sympathetic accelerates the heart and the autonomic inhibits it.

THE NERVOUS SYSTEM.

- Cerebro-Spinal (or central)
  - Peripheral
  - Vegetative
    - Sympathetic
    - Autonomic
      - Cranio-Cervical (or vagus)
      - Sacral

The autonomic nervous system consists of fibers and ganglia, but these do not form ganglionated chains like the sympathetic division. Their neuronic cells are situated in the midbrain, in the medulla and in the sacral region of the cord. Recognizing these centers, the autonomic system may be divided into the cranio-cervical and the sacral autonomic. In the cranio-cervical division the fibers follow and largely constitute the vagus nerve, but some of them run in the nervous intermedius and the glosso-pharyngeal. It is disturbance of the cranio-cervical part of this autonomic division of the vegetative system that gives the condition known as vagotonia.

With this brief insight into the new and wonderful field of vegetative neurology we shall proceed with the description of the definite clinical entity vagotonia.

"Vagotonia is a lasting tonic irritation of the vagal part of the autonomic system which maintains its end organs in a state which very closely resembles that produced by electrical stimulation of the autonomic," say Eppinger and Hess, and it is thought by them and others that this tone-irritation is due to, and kept up by, the under or over-secretion of one or more of the ductless glands. This offers splendid opportunity for future investigation.

Vagotonia includes much that was previously relegated to neurasthenia, hysteria, anxiety and fear states and general nervousness, and vagotonia practically takes the place of what were known as the visceral neuroses and the so-called vasomotor neuroses. Vagotonia accounts, in part, at least, for many asthmatic conditions, pseudo-angina, vaso-motor gastric hyperacidity, pylorospasm, and has a definite relation to exophthalmic goitre, the nausea and vomiting of pregnancy, certain states of diarrhea, especially mucous collitis, and to spastic constipation. Vagotonia also embraces some hitherto unexplained cases of bradycardia, arhythmia, vague gastric distress and aerophagia. Vagotonia with tachycardia is often associated with visceroptosis and it should be remembered that vagotonia may be associated with other diseases, either organic or functional.

Vagotonia is a functional condition, the symptoms of which are numerous and may be major or subsidiary. Part of the extended vagus may be affected or practically the whole of the autonomic system at the same time.

An individual may be more or less uncomplaining but still be said to belong to the vagotonic type when he has gastric hyperacidity, eosinophilia, bradycardia, slight arhythmia, somewhat spastic constipation and sweaty hands and feet. Persons of this type are said to be highly susceptible, especially with regard to salivation and sweating, to even small doses of pilocarpin.

Besides these symptoms, vagotonics may have irregular breathing, occasional tachycardia when associated with visceroptosis or hyperthyroidism, nervous and anxiety states, localized hyperhidriosis, flushings, nausea and other gastric distress, cool damp hands, acne, wide palpebral fissures and intestinal symptoms, as spastic constipation, alternating constipation and diarrhea, or mucous colitis. These patients are usually constitutionally inferior. They often have enlarged tonsils and adenoids, husky voices, tremors of the hands, tongues and eyelids and lessened sensibility to pharyngeal irritation. They urinate frequently and have an excess of phosphates and oxalic acid. These patients are startled by noises, easily frightened, apprehensive, often peevish or self-accusatory, sexually hyperexcitable and usually poor sleepers.

At times some or all of these symptoms undergo an acute exacerbation and we have a "nervous spell" or "attack," the description of which by the patient is usually vague. Gowers, years ago, described some of these "spells" under the name of vagal attacks. The attack consists chiefly of a marked increase in the apprehension and fear symptoms, sometimes to a sense of impending death, rigors or "nervous chills," prostration, acute functional cardiac, respiratory and gastric distress, often pains resembling visceral crises and marked sweating.

Fortunately for these acute attacks, as well as for the chronic states, we know a remedy which is specific—atropin. This drug depresses the over-stimulated autonomic system and may be given in either tablet form or in solution. It may be administered under the skin or by mouth. Personally for chronic cases I prefer it in solution, by mouth, about 1/150th of a grain of atropin sulphate three times a day. For the acute exacerbation 1/100th of a grain may be given hypodermatically or on the tongue.

Going over my cases for several years, I find many unrecognized vagotonias. The condition is rather common, easy of recognition when once borne in mind, and the treatment is satisfactory. Of course the atropin medication in some cases has to be backed up by constitutional, nourishing and psychic treatment. We have recognized many of these cases recently and the following are briefly cited as being typical of some of the forms of vagotonia.

As examples of vagotonic conditions, four cases may be briefly cited:—

1. *Vagotonia as a Chronic Nervous Condition.*—This occurred in a white married woman, 36 years old, who had been under many physicians who administered treatment of various sorts for what was called neurasthenia and hysteria. She had always been of a more or less high strung nervous temperament, but for three or four years had been much worse, complaining of fears of crowds, apprehensions, fear of being alone, fearing that she had taken too much or too little medicine, or that the medicine had or would have the wrong effect. She flushed easily, had sweaty, cold hands and feet, arrhythmia, her pulse showing at times bradycardia and at times tachycardia. She had some hand tremor, spastic constipation, gas on the stomach and precardiac distress.

She was put on atropin sulphate, 1/120 three times daily and recovered in several weeks. Her pulse became steady, she ceased to flush, her constipation and stomach symptoms disappeared and she lost her fears.

2. *Vagotonia—Acute Attacks.*—This case was a married white man, age 30, who had frequent attacks of bradycardia, chilliness, sense of impending death, great prostration, "clammy" hands and feet and dyspnea. Similar attacks were described by Gowers ten years ago as vagal attacks. This man was apparently well between the attacks, which occurred every week or so and lasted several hours to a day.

He was seen by me in 1913 and put on various medicines without improvement until May, 1916, when he was put upon atropin sulphate, grain 1/120, three times daily, and his attacks ceased. A dose of atropin also cut an attack short.

3. *Vagotonia with Marked Local Expression.*—This case was a young lady, 21 years old, who had acne, nervousness, apprehensions, flushings, hand tremors, slight bradycardia and profuse sweating of the hands and feet. She had experienced this hyperhidrosis since childhood but it was worse under stress or excitement. Her hands perspired so that unless she held handkerchiefs in them sweat would drop on the office floor at the rate of a drop every few seconds. Atropin helped this case and she did better still with atropin, calcium lactate and suprarenal gland extract, but the sweating condition was never really conquered although her general nervousness and other symptoms practically disappeared.

4. *Vagotonia as a Symptom Complex in an Organic Disease.*—This patient was a single white man, age 54, who had a typical and well-marked case of posteriolateral spinal sclerosis of specific origin. In addition to his organic symptoms he had periods lasting from a few hours to many days of precardial distress, arrhythmia, chilly sensations, flushing, general sweatings, dyspnea, prostration, nausea, emotionality, vertigo, apprehension and depression.

The opinion was given that the cardiac condition was functional and due to stimulation of the vagus nerve. This opinion was confirmed by Doctors VanderHoof and Hutcheson. Atropin 1/120 three times daily was given and controlled the attacks.

Many other cases could be cited, but these are mentioned as illustrative of the several types. The writer has never observed the condition in a negro. However, his practice among the negroes is not extensive.

212 West Franklin St.

FEAR OF HIS HANDS: WITH PSYCHOANALYSIS OF THE SAME.

By

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I WILL report a case of Anxiety Hysteria treated by the psychoanalytic method. It was undertaken out of sympathy for a worthy man, who was much below the desired mental status. Patient R., Canadian American born, male, forty years old, was completely incapacitated to support his family, consisting of a wife and five children. The chief symptom is that he is afraid of his hands. His family history was negative. He passed an uneventful boyhood, excepting that he was timid, easily hurt, and a "mother's boy." His only brother was favored more by the father. He had an understanding with his brother regarding the care of the parents. He was to have them live with him the remainder of their days, and as a compensation was to have the old home. After their death, however, the brother tried to get some of the estate. This caused ill feeling, and led to harsh words. He was for a long time fearful that the property might be taken, causing him much worry and anxiety. He finally retained it, and now lives in the house where he was born.

I saw him for the first time in July, 1915. At this time he began to be "puzzled" as to the meaning of some peculiar feelings. R. had only one severe illness, fifteen years ago—the diagnosis of which is still in doubt. He was given up to die, last rites of the church were administered, but he suddenly began to convalesce, and later made a complete recovery.

His inability to grasp even the rudiments of the analysis made progress slow and discouraging. It was next to impossible to get any free associations. He regressed continuously to his original complaint. The analysis was carried on in anything but a systematic manner. He came when he had his bad days, and then remained away as long as two weeks at a time.

He has worked driving logs on the river, but for the past six years has been house painting and paper hanging. His wife became ambitious after his change of occupation and catching the spirt of the times, demanded that he bring home more money. This continued until her death, one year ago.

He dreaded to come home unless he had made good collections of some outstanding bills; then with an unusual amount of money, he could purchase an evening of comparative quiet. This was short lived, and the nagging and fault finding continued. After her death there was no change, the oldest daughter took up the fault finding where the wife had left off. To say "there is no place like home" was all too true, and he would travel the streets day and night, pushed by a spirit of unrest and anxiety. Since the death of his wife, he is unable to lie down in the daytime, as he is afraid "she" will appear. This phobia will not let him rest, and he is obliged to arise. He is constantly saying, "I am so tired—I am so tired." He has a ravenous appetite—"can't seem to fill up."

He was unable to write, could not recall any dreams, claiming he could not sleep nights. After several months, however, he related the following dream: "I was on the top of a high tower that swayed back and forth. With me were two men. The base of the tower was surrounded by concrete. Suddenly, one of the men fell off and was killed. I said, 'we better get down. This is a dangerous place.' " When asked what he thought of the dream, he said, "I don't see anything to it." I asked who it was that fell off the tower. He remarked, "Nobody I ever saw before." When I suggested it might be his brother, he hesitated for awhile and then said, "Yes, I can see his cap and coat." He laughed uneasily, saying, "Ain't that funny?" Nothing more could be obtained from the dream by association. Asked if he ever thought of killing his brother, and said, "I have been afraid of what I might do." I called attention to the fact that here was a reason for fearing his hands, as he might do violence to somebody. He seemed somewhat disturbed, when I asked him what kept him from killing his brother. After a little, he said, "I had a fear of being arrested." The dream has helped him, in the fulfillment of a wish, by his brother killing himself accidentally, thus keeping his conscience clear and relieving him of the fear of being arrested. Asked why he was in such haste to come down from the tower, "I was afraid of hurting myself." He now recalls that he was frightened whenever he thought of self abuse, as he had been told that it would injure him; another reason for fearing his hands.

He has an "all-gone" feeling in his stomach, and has the greatest difficulty in keeping his hands off his abdomen. He came to my home mornings, before I was awake. If asked to wait, he would sit down for a few minutes, but complained that things were pushing him; and although very tired, he could not keep still. When he saw people approaching him, he had an all-gone feeling, and it seemed as if he was going to drop. He would beg of me to do something in order that he might go to work. He was emotional at these times and cried a great deal. When asked why he felt so when meeting people, he said, "They ask me how I feel, and when I am going to work. That word 'work' makes me feel awful bad." Sunday was the worst day in the week, and he dreaded its coming. The neighbors would come in, and in attempting to help him by misplaced sympathy or a desire to inflict pain, pursue him with the old hateful question, "When are you going to be well enough to go to work?" I need not tell you that after several months in vain attempts at association, during which, with one exception, there were no dreams, but an ever increasing demand for help, it seemed as if this particular case was doomed to failure.

However, the following dream, after one and a half years had elapsed, threw some light on the malady and contained many elements found in the neurosis. Dream: "I was on a merry-go-round. Seemed as if I were a night watchman and was turned around to see the place I was expected to watch. T. S. was there, and overhead were a lot of sweaters. I took one, saying, 'This will come in handy.' T. S. said, 'Don't take that, it is not yours, and you will be arrested.' I then awoke." Associations: "Merry-go-round" recalls riding on one that broke down, giving him a great fright. His mother came over to the place with a whip, striking him on the finger. Patient shows scar. This injury caused an additional scare. "Night watchman" reminds him of a policeman. "Policeman" recalls running away from school, when a small lad, and his mother threatening him with arrest said, "If you don't go to school I will call a policeman." She kept her word and called one. The patient was very much frightened and ran upstairs, crawled under the bed. The sheriff came up to the room and in a loud voice said, "Where is that boy, I will take him to the reform school." Patient was terrified and never ran away from school again.

"Taking sweaters" recalls stealing some clothes from the church, but was so frightened, soon after, that he returned them with great haste. "This will come in handy" refers to everything useful. T. S. saying, "Don't take that. It is not yours and you will be arrested," recalls several petty thefts, followed by fright.

When asked to state some of his fears, he gave the following: afraid of his hands and other peoples' hands. Not working, he fears arrest for bills overdue. Fears to go to sleep, doesn't expect to wake up. He and another boy were playing with a pick pole, when he was accidentally struck on the leg. He ran home in terror, feeling the blood in his shoe, coming up between his toes. He asked that papers be put down to protect the floor, but on removing his shoe no blood was found, and on further investigation the skin was found to be unbroken. While working in the woods, he cut his knee, and in great fright, ran two miles to the camp. The foreman found, on removing his trousers, a slight scratch only. This list will suffice to show how he overestimates all things that injure him in the slightest degree.

Returning to the dream: the job he wishes for, shows how much he really wants to work. A man sitting on a merry-go-round, turned to see the place he is expected to watch, accompanied by music, presumably, and being employed as a night watchman, whose duties are not considered arduous (as he is expected to sleep half of the night) makes a picture, difficult to equal, of an easy occupation, when a man is anxious to work. Taking sweaters is symbolical of all things one wants without working for them. Fear of arrest, causes him to identify himself with a policeman, thus allowing him to steal what he wants, without fear of being taken into custody, as he doesn't anticipate arresting himself.

Consciously, he wants to work; but unconsciously, he does not want to work. A suggestion or an auto-suggestion, containing the idea that work has been known to injure people, would immediately be renounced, accompanied by fear. His wife's demand for more money would require more hours of work, and he was then working at top speed. Like an over-trained athlete, he now weakens under the constant nagging and long hours of struggle, he breaks through into a neurosis, and renounces the whole vocation, satisfying the unconscious by frights, bad feelings and general weakness of a physical nature.

Looking at his hands gave him that all-gone feeling, as they remind him of his duty to go to work. People seemed to be pushing him by asking when he would be able to work. I explained that his exhaustion and all-gone feeling was a ruse, to prevent his working. A man too tired to walk, and who did not sleep nights, could not be expected to work. Reassuring him that in reality work was all the medicine he needed to quiet his fears of hands, arrest, etc., etc., he manfully accepted my propositions, and went to work. He has been busily employed for weeks, working every days, Sundays included. No relapses to date.

EDITORIALS.

Conducted by

MARC RAY HUGHES, M. D., DAVID S. BOOTH, M. D.,
BAYARD HOLMES, M. D.

DISAPPEARING GIRLS AND WHITE SLAVES.

Grace Humiston of the New York Bar Association, discussing the problem of the disappearing girl, from the Cruger-Cocchi viewpoint, remarks that the monotonously regular recurrence of the disappearing girl sensation has acquired a new and sinister significance from the Ruth Cruger case, which led to the discovery of twenty-two dens like that where she was found. A recent writer* says:

"Almost every community has ben stirred to its depths at one time or another by the disappearance of a young girl under mysterious circumstances. Thousands have returned with some casual explanation for their departure. Other thousands have gone forever, leaving no clue tangible enough to afford an explanation. Police records show that many young women listed as 'missing' are subsequently accounted for. Annually scores disappear permanently."

What is the real problem of the disappearing girl? Certainly the crux of the problem is not retrospective effort at tracing her. Instead of a transient campaign against the systematized or sporadic ruining of girls, contingent upon a sensational case, there should be a persistent and consistent endeavor to safeguard girls from such perils and dangers as may be anticipated from previous experience."

"Many distracted parents are as much intent upon clearing their daughter's memory of the stigma of mysterious disappearance as they are of learning the missing girl's whereabouts. For the victims are frequently assumed to have 'run away for no good reason.' Indeed, so generally has this attitude been manifest that it is probably true that scores of 'missing girl' cases have never been reported to the authorities because the relatives fear scandal if the mystery is made public. Twenty-four hours of delay or vacillating hope that the victim will 'turn up all right' is often sufficient to seal her doom or permit the abductors or murderers to escape. The attitude of certain police officials in these matters is to be discouraged. In some instances more zeal has been directed toward tarnishing the victim's good name than has been exerted in a search based upon the assumption that she is a victim of criminal aggression. It is convenient to assemble meager evidence that the girl was seen boarding such and such a train or taking a certain mysterious taxicab in company with a young man, always unknown. This promptly curtails the searching activities. This exceeding proneness to put the entire burden of responsibility upon the shoulders of the missing girl herself is a great evil. It disarms vigilance and discourages the endeavors of such men as may grudgingly be detailed to the case. It leaves the distraught parents with the additional bitterness of wondering whether their daughter has indeed voluntarily absented herself from home. And above all it serves to heighten the sense of security of such individuals as may have been implicated in her disappearance. It is a singular fact that every 'missing girl' case brings out its anonymous letter writers with false and foolish clues and 'tips,' its volunteer 'witnesses' who identify the girl from a photograph as the one they recall having seen boarding a train or a boat on the day of the disappearance. Plausibility

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*Chicago *Herald Sunday Magazine*, July 29, 1917.

is added by the additional recollection that there was a man with her. This opens the field for the theories of elopement, clandestine meeting and similar false trails."

This tendency crops up in all sorts of crimes and whether from desire of notoriety, psychology or gain, creates the "confessors" so often appearing in politics or labor cases. Psycholagny in hysterics, instabilities and neuropaths is most in evidence in missing girl cases.

"It is not to be inferred that no girl ever drops from sight at her own volition. This would be whitewashing human whims and motives too utterly to square with the facts. Girls do disappear of their own volition. Some find home discipline and restraint irksome and deliberately leave for points unknown, where they may follow the dictates of fancy. Others elope with young men unknown to the family and when disillusioned keep their whereabouts secret to cloak for domestic scandal.

"As a concomitant of the disclosures in the 'missing girl' mystery there has been a reversion to the once popular discussion of 'white slave rings' and 'trusts.' There are groups or cliques devoted to the enslaving of girls. It is these groups or small combinations that very satsisfactorily account for most girls who drop from sight. There may be only two or three acting accomplices in the spiriting away of a girl. There may be eight or ten or more. But the 'trust' is the fabrication of some mind rendered overzealous by a natural horror of the whole calling."

The harlot, Havelock Ellis* remarks, under ordinary conditions and unharassed by prosecution, is much less alone than many married women. She is not fettered in humble dependence on the will of a husband from whom it is the most difficult thing in the world to escape. The harlot is bound to no man and free to make her own terms in life. Apart from arbitrary accidental circumstances due to the state of social feeling the harlot enjoys an independence married women are struggling to obtain. The white slave trade is therefore not prostitution but commercialized exploitation of it. The white slave traffic is a reality depending almost wholly on houses of prostitution. The white slave traders are engaged in a very profitable business, but without need to run serious risks. The world is full of girls who are overworked, underpaid, ignorant, vain, weak, greedy, lazy or even afflicted with an innocent love of adventure. Of course, as Brand Whitlock,** when Mayor of Toledo, pointed out, many alleged shocking cases are but variants of the stores which had been psychologically timed to meet the hysteria which the pulpit, press, and Legislature had displayed, still, as developments from the Minnesota, Michigan and Wisconsin stockade dens show, there are cases of white slave traffic where women are transported from State to State for purposes of exploitation by prostitution. This trade showed the same organization and much of the same methods that were employed to transport women from England to the Continent in 1880† according to an investigation by the English House of Lords. Their results were not quoted in the hysteric agitation by the Anglican bishops since they are opposed to remedies based on the history that all prostitution was white slavery. The remedies proposed by Humiston are of this last nature.

The vanished girl's own community should withhold judgment until facts make haphazard deductions unnecessary. They are under a moral obligation to reveal anything they may know about any suspected person's habits or practices which might shed light upon the case.

The police are less to blame than might be assumed from these amateur statements of law and evidence. The enormous number of hysterics and defectives, moral and mental, among the harlot class shows this. Behind the hysteric and defective tendencies often lies the desire for a new sensation. It is shown in the Welsh proverb that the prudish are often the most intrinsically unchaste. Their sexual imagery tends to exhaustion and hence to the need of a new excitant.

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*Essays in War Time.

***Forum*, February, 1914.

†Taxil, La., Prostitution Contemporaries.

Grace Humiston remarks that sexual domination can so permeate the whole character and philosophy of the individual that occasional crimes against womanhood by degenerates must always figure as a horrible possibility of community existence. But the wholesale sacrifice of womanhood upon the altar of ignorance and vicious conspiracy can be checked.

The public schools—particularly the high schools—could be made excellent media for instructing maturing girls to be wary of strangers, strange places and dangerous situations.

There should be a central bureau of registration for all young women employed in each large city. The name and age and residence of each girl would be noted as well as the name and address of each employer. Any unexplained absence would be reported to the police. This innovation, accompanied by a course of lectures to the growing girl and a substantial modification of police methods in treating the cases of vanishing girls, would be largely corrective of the white slave evil.

The last suggestion reveals a singular ignorance of constitutional rights (gained in the English speaking countries only, by centuries of effort), criminology and sociology. The exploitation of the "madam" for "protection" purposes by the notorious corruption among the police, would be increased by such lists.

Cases of pardoned and reformed criminals show that such lists are a fertile source of a police blackmail which results in renewed crime to secure cash to pay the police. Put working girls under such surveillance and exploited harlotry will increase.

In regard to the influence of sex abnormalities, it must be remembered other abnormalities than hysteria play a part in causing disappearance. In a recent case in the South, a girl whose disappearance had caused the arrest and near lynching of two innocent men; one for abduction, one for murder, was found in a neighboring state enjoying the tittillation of picking cotton in male attire. Life as a girl at home was too tame for her. Samuel Ackerman of Toledo, Ohio, lately committed suicide for fear discovery of his real sex by exemption boards would force resumption of female attire. He had lived in Toledo for twelve years as a man and had married a wife. She lived with him nine years and then obtained a divorce for extreme cruelty. The wife then remarried and became a mother. She claims not to have known Ackerman's real sex until after her second marriage.

SELECTIONS.

CLINICAL NEUROLOGY

THE NERVOUS MANIFESTATIONS OF SYPHILIS OF THE EYE.—Joseph Collins, *The American Journal of the Medical Sciences*, 1918, Vol. CLV, p. 649, writes that in 467 of 790 patients it was noted that the pupils displayed the Argyll Robertson phenomenon. It is interesting to note that in proportion to the thoroughness of examination of patients who have syphilitic disease of the nervous system is the increased frequency with which the Argyll Robertson phenomenon has been found. Indeed, it may be said that the only infallible sign of syphilis of the nervous system is the failure of the pupil which is not fixed mechanically to react to light. In the 790 cases upon which this study is based there was a history of diplopia in 150 cases, *i. e.*, in about 20 per cent. In only one-half of the number were there any evidences of third nerve involvement when the patient was examined. In our statistics the third nerve showed evidence of being partially or completely paralyzed in 62 instances, and it is interesting to note that it was only affected on both sides in 5 instances. Paralysis of the third nerve in syphilitic disease of the nervous system is not infrequently associated with disorder of the sixth nerve; very rarely with involvement of the fourth. In this series of 790 cases the sixth nerve was involved 31 times; it may have been involved in other instances and have been the cause of the diplopia; in these 31 instances it was affected at the time of examination. The fourth nerve is affected in cases of syphilis of the nervous system very rarely. In five instances only was any disorder of it recorded in these statistics. In one instance it was bilateral. In 95 cases of the entire number the optic nerve was found to be diseased, showing inflammation, choked disc or atrophy, neuritic or simple. Among the 20 cases of cerebral meningitis papilledema was encountered five times, and in 251 cases in which the diagnosis of cerebrospinal syphilis was made it was noted seven times; in every instance the choked disc was bilateral. It is interesting to note that in 9 of the cases diagnosticated as tabes or taboparesis there was either optic neuritis or choked disc. In only 1 case of general paresis was there atrophy of the optic nerve, and in this case the tendon jerks were exaggerated. One of the extraordinary and inexplicable things about general paresis is that it does not cause optic atrophy. The author has never seen an instance of disorder of the pupils caused by syphilis of the nervous system disappear spontaneously or under treatment. Some of the muscle paralyses yield to treatment readily, others are most rebellious. The important matter is to distinguish one from the other. In a general way it may be said that the vast majority of cases of muscle paralysis associated with symptoms that justify the diagnosis of meningitis, especially those coming on abruptly, yield to treatment or recover spontaneously. On the other hand, those due to nuclear lesion (which are apt to develop insidiously) are rebellious and unamenable, but the majority of permanent ocular palsies are not of nuclear origin. Multiple ocular palsies indicative of diffuse lesion are quite as likely to yield to treatment as single paralysis.—*Amer. Journ. of Syphilis.*

PARALYSIS AGITANS AND ITS TREATMENT WITH PARATHYROID GLAND.—Berkeley, *Medical Record*, March 2, 1918, states that the confusion and contradictoriness of autopsy reports long ago led C. L. Dana and others to advance the view that a chronic toxemia lies at the base of the disease; and it was suggested by Lundborg of Stockholm in 1904 and by Berkeley independently in 1905 that a chronic dycrasia or insufficiency of the parathyroid glands is quite possibly the cause of the disease.

Berkeley's own reasons for this view have been frequently stated before, and need be only summarized now: (1) The symptoms appearing in rabbits and other convenient experimental animals upon removal of the parathyroid glands are suggestive; shivering and twitching of the voluntary muscles, rigidity, convulsions, salivation and often a quite typical "propulsion" may be observed. (2) The disease has been reported several times in conjunction with myxedema, and with exophthalmic goitre, where the contiguity of the diseased thyroid might well be supposed to work mischief to the parathyroids. (3) the parathyroid glands have been reported in a diseased condition in a fair percentage of the autopsies upon cases of paralysis agitans. (4) The use of a properly prepared parathyroid extract by the mouth, or better by hypodermic administration, has been productive of remarkable benefit in a majority of the cases treated. This therapeutic test has been applied to hundreds of cases during a period of more than ten years past; and the treatment has shown a steady and gratifying increase in popularity.

Admittedly these considerations are by no means a demonstration of the etiological relation of shaking palsy to parathyroid insufficiency; but the hypothesis certainly comes within the bounds of reasonable scientific speculation.

By the profession, both here and in Europe, during the last ten years the parathyroid theory has been received with considerable favor. In International Clinics for 1912, Berkeley reviewed the literature—most favorably—up to that date. Since then J. Greenwald has advanced some interesting chemical considerations against the parathyroid theory which Berkeley does not think conclusive. Troemner thinks the parathyroid hypothesis "possible"; and Schioetz defends it with considerable enthusiasm.

Berkeley takes up finally the clinical administration of parathyroid, as he is accustomed to give it.

First of all, it is absolutely necessary that an efficient preparation, made from perfectly fresh and carefully identified glands, should be used. The chemical details of Berkeley's own extraction process, which he has worked out after many years of experiment, have been published in several places, and need not be again detailed here. His formula is now for sale by several pharmaceutical wholesalers. It comes in small capsules (one-fiftieth grain of parathyroid extract in milk sugar), and as hypodermic solution; the latter is marketed in small rubber-stoppered bottles of five mils. The hypodermic is the ideal preparation, but is more expensive, and many patients do very well on the capsules.

The dose by the mouth is one capsule two to six times a day, preferably after eating. The hypodermic solution is given in doses of one or two mils once or twice a day. One mil contains one-fiftieth grain of the extract. This arrangement evidently mixes the metric and English systems, but is justified by its convenience, and is easily remembered. The solvent is physiological saline solution. A trace of chloroform is added as a preservative Aseptically injected, the hypodermic solution should be absolutely without reaction.

The benefits of treatment usually appear slowly. They consist in diminished rigidity, shaking relieved or arrested, restlessness and insomnia relieved, and salivation abolished. In some of the cases now and then quite a miracle is performed, as for example in a report recently published by Martyn. The writer states that the patient, whose condition had been desperate, was so remarkably benefited that he was enabled to bathe and dress himself, read and write comfortably once more, sleep well, and amuse himself by pruning his own orchard trees again—a pleasure in which he had not been able to indulge himself for a long while. The only setback occurred when for a period of a week or so he was unable to get a fresh supply of the medicine. Berkeley himself last year reported two cases which have lately attracted his special notice. One of them, the father of a medical associate, has been literally kept alive by Berkeley's parathyroid formula these ten years back.

Contraindications are very few. Personally in many years, and with more than a hundred patients, Berkeley has seen only one, an elderly man, who could not take ox-parathyroid at all. He seemed to have an anaphylactic sensitiveness to the foreign proteins. This may also have been the trouble with a patient reported to Berkeley last year.

Some patients get "nervous" and shake worse when the dose is pushed too fast. To these the remedy should be given in divided and infrequent doses till they become accustomed to it. Berkeley has one patient who is sure the parathyroid constipates him; but he overcomes this very easily with a simple laxative.

Improvement is often noticed in two weeks, very generally in two or three months; and it should continue for a few months more. After this the remedy should be indefinitely continued, but in smaller doses—just enough to maintain the benefits already secured.

Cardiac disease, arteriosclerosis, and albuminuria are no contraindications. These conditions may even improve under the parathyroid treatment. None of the text-book remedies for the intercurrent diseases of old age is incompatible with parathyroid extract. Hyoscine and parathyroid sometimes go very well together, working better than either alone.

Easy travel often benefits these patients, and they are appreciably sustained by cheerful company, a hopeful environment, or perhaps an appeal to their religious faith. Institutional cases do badly, for reasons too apparent to require amplification. The sufferer should by all means be kept out of a hospital atmosphere.

Under these circumstances, and with an intelligent individual, application of the principles of treatment outlined above, these patients often do very well for many years, reaching and passing the scriptural threescore and ten with but little more inconvenience than usually befalls normal old age.—*Therapeutic Gazette.*

OBSERVATIONS REGARDING THE DIAGNOSIS AND TREATMENT OF BRAIN INJURIES, WITH OR WITHOUT A FRACTURE OF THE SKULL.—William Sharpe, *Minnesota Med.*, August, 1918, asserts that the diagnosis and treatment of brain injuries have advanced most rapidly within the last few years. The clinical symptoms and signs are varied and frequently confusing in these patients. Apparently, in many cases, the more extensive the skull fracture the less seriously is the brain injured, and, on the contrary, the most dangerous of brain injuries are frequently not even associated with a fracture of the skull. As is well known, the fracture in these cases (if we exclude depressed fractures of the vault which should always be elevated or removed) is possibly the most unimportant part to be considered in the treatment, whereas the presence of a marked increase of the intracranial pressure with or without a fracture of the skull should immediately cause the patient to be withdrawn from that large group of patients properly treated by the expectant palliative method, and the advisability of an early operative procedure to relieve the increased intracranial pressure should be considered.

In the treatment of brain injuries with or without fractures of the skull, if the patient is allowed to develop definite paralysis, a lowered pulse-rate, Cheyne-Stokes respiration, and that appalling group of extreme intracranial pressure signs, then these patients "get along" just as well without operation as with operation at this stage—the mortality being 50 per cent. and over; but patients with brain injuries should not be allowed to reach this stage of medullary compression due to the high intracranial pressure—it should be anticipated by the accurate diagnostic methods now known, and if a marked increase of intracranial pressure is ascertained, then an early relief of it should be advised, not only to save the life of the patient, but to lessen the post-traumatic conditions of changed personality either of the excitable or the depressed type, persistent headaches, early fatigue, occasionally epilepsy and that long train of post-traumatic conditions in brain injuries due in the majority of cases to a prolonged increase of this intracranial pressure.

Of 487 adult patients having acute brain injuries with or without a fracture of the skull, in only 155 (31.8 per cent.) were there marked signs of an increased intracranial pressure, and therefore only these patients were operated upon to relieve this increased pressure, whereas the remaining 332 patients did not show definite signs of an increased intracranial pressure and were therefore treated by the expectant palliative methods of absolute quiet, ice helmet, and catharsis; if in shock, then the routine treatment of shock. It is seen that less than one-third of the patients having injuries with or without a fracture of the skull were operated upon, and approximately this same ratio has continued during the past year. It is this careful selection of patients in regard to the advisability of an operation, the type of cranial operation used, and of the greatest importance, the ideal time for performing the operation, that have made it possible to lower the mortality of fractures of the skull from an average of 50 per cent. of most hospitals to 28.4 per cent. at the Polyclynic Hospital, and if we exclude the non-operated moribund patients dying within three hours after admission to the hospital from shock, internal injuries and the many cases in which the fracture of the skull was but an incident in the patient's general condition, the mortality is lowered to only 17.9 per cent.

The most important and the difficult question in the treatment of brain injuries with or without a fracture of the skull in which operation is advisable, is the time when it should be performed.

The two periods in which an operation is distinctly contraindicated in cases of brain injury, are, first, the condition of severe shock in the very beginning, and secondly, the condition of medullary edema and collapse—the death knell of the patient. To advise a cranial operation—no matter how badly the skull is fractured, nor how extensive the intracranial hemorrhage seems—with a patient in a condition of severe shock with a pulse-rate of 120 and higher, takes away whatever chance the patient may have of surviving the shock; the operation is but an added shock and merely hastens the exitus. No patient having a brain injury should be operated upon in this condition of shock; the mortality is most high, and if a patient does recover from an operation in this period of extreme shock, then he recovers in spite of the operation. Cranial operations for brain injuries in this stage of shock were frequently performed in the past and most disastrously, and thus operations were almost discredited in the treatment of brain injuries. The natural reaction following these early operations in the period of severe shock was to wait until there could be no possible doubt that the patient was going to die, unless, as was thought, a cranial operation was performed; that is, the patient was allowed to reach the period of extreme medullary compression—a pulse rate of 50 and below, irregular Cheyne-Stokes respiration and pulse, and profound unconsciousness—before a cranial operation might be considered. This is a most dangerous stage for these patients to reach, and it is doubtful whether recovery can occur even with an operation at this late period, the mortality being very high. But if the patient has struggled through this period of medullary compression, and finally reaches the stage of medullary edema, when the pulse-rate begins to ascend quickly to 120 and higher, respirations become rapid and shallow, that is, the stage of medullary collapse, then we have the second period when no patient should be operated upon—they all die, operation or no operation.

The aid of the Roentgen rays is important in the treatment of those traumatic cases only in patients with doubtful depressed fractures of the vault, and in latent fractures of the skull, where the bump is so apparently trivial that the patient might not be so carefully examined and treated as the condition would warrant. On the contrary, no patient with high intracranial pressure should be obliged to wait "over night" or for a period of hours merely to secure a Roentgenogram of the skull; it is of no importance in the treatment of these acute intracranial lesions whether a fracture is present or not; if there is a high intracranial pressure as shown by the ophthalmoscopic examination and by the measurement of the pressure of the cerebrospinal fluid at lumbar puncture by the spinal mercurial manometer, then a cranial operation is indicated to relieve this increased intracranial pressure by the drainage of possible hemorrhage and cerebrospinal fluid; it is not so much a question of removing the hemorrhage as it is of lessening the increased intracranial pressure—whether that pressure is due to hemorrhage or edema—the operative indication is the same; many cases of head injuries at autopsy have revealed no hemorrhage at all, merely a "wet" edematous swollen brain, but sufficient to cause medullary compression and the death of the patient.

The symptoms and signs of brain injuries in babies and children are very different from those following similar injuries in adults. In babies, owing to the open fontanelles and to the greater elasticity of the dura, the symptoms and signs of brain injuries are often so mild that they are frequently overlooked. Unless most careful and thorough neurological examinations are made and certain special aids to diagnosis are utilized, such as the ophthalmoscope and the examination of the pressure of the cerebrospinal fluid by the spinal mercurial manometer, these intracranial lesions may escape serious attention for a period of months in newborn babies, and even years in many children. The remote effects, such as spasticity, mental impairment in many cases, and frequently epilepsy, are merely reminders of the former intracranial damage, so often a supracortical hemorrhage, and we should be most careful in our examinations and treatment to anticipate these frightful sequelae. The older the child following a cerebral birth trauma, and the longer the period of time since the injury in the older children, the less hopeful is the prognosis. These late cases are derelicts, as it were, and can merely be improved; whereas if the condition of cerebral hemorrhage and edema is recognized early after the intracranial lesion has occurred, and if there is a marked increase of the intracranial pressure, and the proper operative treatment of cranial decompression and drainage instituted, the ultimate improvement will be greater and possibly a cure obtained. These lesions in babies and children have been overlooked and even neglected. Naturally, the older the child, the more do the sypmtoms and signs of an intracranial lesion approximate those occurring in an adult, and yet the brain in children under the age of puberty is so adaptable to changed conditions, and to a certain extent less delicate, that even a high degree of intracranial pressure due to cerebral hemorrhage and edema may present clinically few signs of its presence, and in many cases it can be withstood and undoubtedly is successfully overcome by natural absorption alone. This fact should always be remembered in the treatment of brain injuries in children, so that no operation should be advised, unless the intracranial pressure in these cases is very high and when it is doubtful if the child can "take care of" this increased pressure alone; thus does the treatment of brain injuries in children differ from that in adults. Naturally, just as in adults, all traumatic depressions of the vault with or without a definite fracture of the bone itself should be elevated or removed; in babies, the use of forceps in difficult labors frequently produces a definite depression of the vault without a fracture of the bone itself owing to its greater resiliency, and unless this depressed area of bone is elevated or removed, the danger of future cerebral impairment is great indeed. It is frequently not necessary to open the dura in these cases of local depression of the vault in babies, as subdural supracortical hemorrhage is apparently of rare occurrence. Naturally, in cases of doubtful subdural hemorrhage and cerebral edema, the dura should always be opened through a subtemporal decompression, just as in adults having an increased intracranial pressure associated with a depressed fracture of the vault the local bony depression is elevated or removed.

Since it is quite a common belief that once a man has had a fracture of the skull and then recovers, he is never the same person again, the author examined the records of the large hospitals of New York City during the decade of 1900-1910, and traced 34 per cent. of the patients discharged as "well" or cured. Of these 34 per cent. of the total patients found, 67 per cent. of them were still suffering from the effects of the injury—that is, two-thirds of them were not as well as before the injury; the chief complaints were persistent headache, a change of personality of the depressed or of the excitable type and thus emotionally unstable, early fatigue making any prolonged mental or physical effort impossible and thus the inability to work, lapses of memory, spells of dizziness and faintness, and even epileptiform seizures in a small percentage of them. In examining the hospital records of the patients having these post-traumatic conditions, it was ascertained that these were the patients (and there were but few exceptions among those who regained consciousness gradually after several days and remained in the hospital for a period of four weeks and longer), whose charts made frequent mention of the severe headache and a low pulse-rate of 60, and in some cases below 60—that is, the usual clinical signs of an increased intracranial pressure; an ophthalmoscopic examination had rarely been made. Many of these patients still showed the results of the increased intracranial pressure in their fundi and at lumbar puncture, and these were the ones upon whom a cranial decompression even at this late date of several years caused a marked improvement; the operative findings were always associated with a "wet" swollen edematous brain. Many of the so-called post-traumatic neuroses are frequently superimposed upon this definite organic basis as the result of the brain injury. The treatment, therefore, of brain injuries should not be limited merely to the recovery of the patient as far as life is concerned, but it should also be directed toward obtaining a normal individual—approximating as closely as possible the condition of the patient before the injury.

SYPHILITIC MULTIPLE SCLEROSIS.—DIAGNOSED CLINICALLY IN SPITE OF NEGATIVE LABORATORY TESTS.—Tom A. Williams, *Nashville Journal of Medicine and Surgery*, 1918, Vol. CXII, p. 35, believes that the low lymphocyte count in the presence of such severe symptoms and the relative poverty of radicular signs indicate that the pathologic process causing the symptoms is within the central nervous system in the main, and not merely an involvement of the roots by an extension from the meninges into their coverings of syphilitic leptomeningitis, as in the case of tabes dorsalis. There are, in all probability, foci of ill-nourished, if not necrotic tissue, scattered throughout the central nervous system, perhaps as a result of endarterial proliferation which may have led in some cases to obliteration. In proportion as this is incomplete, and the tissue elements have not perished, there will be restoration of function, as tissue activity is resumed upon the removal of exudate from arterial wall or connective tissue, by the destruction of its cause, the treponema pallidum, by salvarsan or mercury.

In the presence of lesions of this character, the signs may lack all systemization, as in this case. In insular sclerosis it is rare that the mid-brain, or the pyramidal tract, escapes when the process is at all extensive. The absence of nystagmus and of extensor response of the toes immediately make the author suspicious of this diagnosis. The experimental therapeutics confirm the author's doubts; but unless the luetin reaction is regarded as pathognomonic, only an examination postmortem can give absolute proof; and in some cases even this has failed to distinguish between disseminated sclerosis of the usual type, and that sometimes believed to occur as a result of syphilis. It must not be forgotten that postmortem appearances are after all merely the results of the reaction of the body to insult, and that these results both resemble one another and vary so much that few of them are pathognomonic for any particular invasion. For instance, even plasma cells, so characteristic in paresis, merely denote chronicity, and may occur under many conditions quite irrespective of sypihils. Again, during life the reactions of the body to the particular noxa are by no means certain; otherwise we should not find Wassermann reaction absent in nearly 40 per cent. of tabetics, and we should not find it present as a reaction to the organisms of leprosy.—*American Journal of Syphilis.*

REPORT IN NEURO-CIRCULATORY ASTHENIA AND ITS MANAGEMENT.—Thomas Lewis, *Military Surgeon*, 1918, XLII, 409, renames in this report Da Costa's "irritable heart of soldiers" and his own "effort syndrome"—neuro-circulatory asthenia. The early recognition of these cases is emphasized. These men who are suffering from the symptoms and who have the physical signs of the disease should be carefully weeded out before being sent over-seas. Exercise tests form the most valuable criterion of physical fitness—cardiac or otherwise.

Etiology.—One-half of the cases have had symptoms previous to enlistment. The men give a history of having had dyspnea on exertion with occasional attacks of syncope; they perspire freely, flush readily and have never been able to perform heavy labor. Some have asthma or have chronic nasal obstruction. About 23 per cent. gave a history of acute rheumatic fever (more common in England than in the United States).

Exciting Causes—(1) Infections: Acute rheumatic fever, trench fever, dysentery, diarrhea. (2) Prolonged physical and psychical strain—long service in the trenches, shell-shock, gassing and burial.

Venereal disease, alcohol, tobacco and coffee play no appreciable part in the history of N. C. A. Because of the prominent role which the infections have in causing the disease, a proper convalescence should be allowed.

Symptomatology—Dyspnea on exertion, pain in the left chest; precordial, palpitation, headache, dizziness, faintness, ready fatigue, susceptibility to cold, tremor, free perspiration and hyperalgesia of the precordium are complained of. Sir Clifford Albutt has called attention to the fact that the pain of true angina pectoris is characteristically substernal, whereas the pain in N. C. A. is rather more mammary or pectoral in location. There is a striking disproportion between the severity of the subjective symptoms and the rather minor abnormalities which constitute the objective signs.

Objective Signs—The facial expression is one of exhaustion or anxiety. Two types are seen: (1) The pasty or pallid. (2) The erethic type with high color and dermographia. On stripping the patients shiver and large beads of sweat are seen on the axilla. There is a coarse tremor.

Heart—Apex beat is diffuse in some, forcible in others. There is marked pulsation in the peripheral vessels with a pistol shot in the femorals. The heart is accelerated while the patient is awake—90 to 100. There is a marked difference in the count between the dorsal, standing and after exercise rates. The respiratory irrgularity is marked and occasionally extra-systoles are felt. To climb a flight of stairs rapidly has been the exercise test used. The pulse rate should return to the pre-exercise rate in two minutes. If the length of the return is in excess the man will not be able to stand the route marches or the thirty-minute drills. In cases of N. C. A. the pulse may be imperceptible. A suggestion of a systolic thrill may be present at the apex. Pure systolic murmurs *per se* are disregarded irrespective of location, intensity or transmission, if there is no history of repeated or recent attacks of rheumatic fever. Several attacks or a recent attack of rheumatic fever, slight cardiac enlargement with severe or persistent symptoms and low tolerance for exercise—irrespective of the murmur, are grounds for discharge. A systolic aortic murmur without a thrill or anacrotic pulse and characteristic pulse pressure is disregarded. The after histories of the soldiers with systolic murmurs (11.2 mos.) show that they do just as well as other men. The blood pressure in repose is normal but the reaction to exercise is exaggerated. Electrocardiograms show the normal complex.

Treatment.—A system of graduated exercises is used for sorting and therapy.

Doubtful cases of organic disease are correctly diagnosed through the use of these exercises. Five routine army drills, suitably arranged and graduated, are used. The first exercises are given for 15 minutes and the last three for 30 minutes. The longer drills are supplemented by route marches of two to four miles. The men are examined after the first drill and after every change. The toleration for exercise is the best guide for the disposition of the cases, but the history and physical examination are of some aid. The men referred to the heart hospital are classified: (1) Full duty; (2) light or later full duty; (3) sedentary military employment and permanently unfit. Rest and symptomatic treatment is not advised.

After Histories—Of 558 cases seen in 1916, 272 (49 per cent.) were referred to full duty. The remainder were discharged. Two hundred sixty-two of the former were traced 11.2 months later and showed that 108 returned to full duty; 109 were returned to light duty and 45 were discharged as permanently unfit. Since about half of the cases had symptoms prior to enlistment, measures of prophylaxis should be applied and a longer period of convalescence should be allowed after infections. Men who are observed as having symptoms of N. C. A. should be reported to the medical officers. Men suffering from this symptom complex should not be permitted to go over-seas.—*Cleveland Med. Journal.*

MENINGEAL HEMORRHAGE IN WAR PRACTICE.—Guillian, *Bulletin de L'Academie de Med.*, points out that in penetrating wounds of the skull, nearly all the primary symptoms, as well as the immediate prognosis, are dependent upon meningeal hemorrhage. Indications of it are early coma, epileptiform seizures on the first day, pupillary disturbances, bradycardia and hyperthermia. In all cases of penetrating skull injury which succumbed to shock the author noted both clinically and at the autopsy the presence of meningeal hemorrhage. Inhalation anesthesia and lumbar puncture are attended with danger under such circumstances. Even in simple contusions of the skull, without fracture, due to war projectiles, meningeal hemorrhage is much more frequent than is generally supposed. It is marked by slight mental confusion, headache, slow pulse, anisocoria, etc.; lumbar puncture yields a pinkish or yellowish cerebrospinal fluid. Subdural hematoma may follow; yet its clinical signs—blindness, hemianopsia, aphasia, paralyses, etc., may later completely disappear, either spontaneously or after repeated lumbar punctures. In 1915 attention was called by the author to meningeal hemorrhage from nearby explosive detonations, in the absence of an actual wound. In addition to the frequently present diagnostic signs of meningeal hemorrhage, viz.: headache, neck rigidity, Kernig's sign, bradycardia, etc., Guillain finds diagnostically significant a state of cerebral excitation with mental confusion, the contralateral flexion reflex by pressure on the femoral quadriceps, true defensive reflexes such as those of the frog, and pupil disturbances. In a few cases there was noted a massive albuminuria or a cholemic tint of the skin.—*Charlotte Med. Journ.*

THE REFLEX FUNCTIONS OF THE COMPLETELY DIVIDED SPINAL CORD IN MAN.—George Riddoch, *Brain*, 1918, XL, 264, in a study of several examples of proved completely divided spinal cord, due to war wounds, has shown that the clinical picture hitherto described as typical (permanent loss of spinal cord functions below the lesion) is imperfect. After the sudden, clean transection of the cord in healthy young adults, such as is seen more frequently in war wounds than in civil cases, the portion of the cord caudal to the lesion not only recovers its reflex functions, but becomes highly excitable.

Three clinical stages may be recognized. Class A is characterized by complete muscular flaccidity, the muscles are toneless and flabby, the superficial and tendon reflexes are absent, and there is complete anesthesia and analgesia. The skin is dry and tends to become gangrenous. There is retention of urine and feces. In three patients this stage lasted from one to three weeks.

In Stage B the reflexes, many of them complicated and showing adaptation to an end, can be evoked from almost any part of the paralyzed area. The first reflex to appear is most often a response to noxious stimulation of the sole of the foot, exhibited in three different forms: (1) adduction and flexion of the toes; (2) adduction and flexion of the toes, together with a tightening of the inner hamstring tendons; (3) upgoing toes with contraction of the inner hamstring muscles. In the full development of this reflex a noxious stimulus gives rise to a flexion reflex consisting of a flexion of the hip, adduction of the thigh, flexion of the knee, dorsi-flexion of the ankle and upgoing toes. Simultaneous inhibition of the antagonists can be demonstrated.

When reflexes can be evoked with ease, scratching of any part of the lower limb, or of the abdomen, if it be paralyzed, leads to a complicated response consisting of a flexion spasm of the ventral abdominal wall and of the lower extremity, evacuation of the bladder when its contents are scarcely half the amount at which it would otherwise empty itself, and sweating of the skin. During this stage stimulation of the genital area leads to cremasteric and dartos contraction, erection of the penis and seminal emission. Also during this stage the bladder and rectum are voided automatically. Vasomotor and sweat gland control is adequate.

In Stage C there is gradual failure of the reflex function of the isolated cord and death is brought about by toxic febrile conditions.

It is emphatically brought out that there are no manifestations by which we may be certain that the spinal cord has been anatomically completely divided. (This, of course, has a direct bearing on the indications for operation.)—*Cleveland Med. Journal.*

INJURIES OF THE SPINAL CORD.—Schachner, *Maryland Med. Journ.*, February, 1918, in the record of a most interesting case of the removal of a projectile from the spinal cord, speaks of concussion as an impairment or loss of function without the existence of gross anatomic cord changes. Bailey is quoted to the effect that "to the impartial observer the conviction must be inevitable that the weight of evidence is against the existence of the condition."

Barker's classification of traumatic hematomyelia is cited, *i. e.*, local, profuse local, disseminated, and profuse disseminated. Compression of the cord may be due primarily to the presence of a projectile or other substance, or a portion of a vertebra impinging upon the cord. Secondarily, the compression may be due to edema or hemorrhage. According to Bruns, the segmental root pain, indicating the level of the lesion, are due to compression of the segment from which the root springs and not to pressure upon the root in its intraspinal course.

The hemorrhage may be extradural, intradural, or both extra- and intradural, or into the cord substance (hematomyelia). In the latter case it may give rise to a cyst which may be responsible for traumatic syringomyelia. The presence of hematorrhachis is confirmed by lumbar puncture, which may also have its therapeutic value by relieving pressure. Twenty to thirty cubic centimeters of fluid should be drawn off. Hematomyelia is more common than is suspected. Six out of his 21 cases of injury to the cervical spine showed hemorrhage into the cord, and unaccompanied by any apparent injury to the column itself. Such injuries occur usually in the cervical region and are due to flexion. The hemorrhage selects gray matter from the white because the vessels are less firmly supported in the gray matter. The lower cervical region, primarily the eighth cervical, is considered the favorable region for hematomyelia.

According to Thomas, the factors in drawing the conclusion that there is a complete transverse lesion of the cord are:

Complete paralysis usually of the flaccid type.

A complete loss of sensation in all its forms.

Absent reflexes, especially the knee-jerk, while the plantar reflex, on the contrary, is often retained.

Complete paralysis of the bladder and rectum, with priapism.

Vasomotor paralysis, with severe sweating in the paralyzed parts.

And most important, absence of variations in the symptoms.

Absence of irritative phenomena, such as pain.

Walton, who has studied fractures of the spine, states there are no symptoms which establish (otherwise than through their persistence) irremediable crush of the cord. While total relaxed paralysis, anesthesia of abrupt demarcation, total loss of reflexes, retention, priapism and tympanites, if persistent, point to complete and incurable transverse lesion, the onset of such symptoms does not preclude a certain degree, at least, of restoration of function. He also states that we have no infallible guide to the extent of the lesions.

A careful consideration of the spinal injuries, as they are revealed in literature. justifies one in emphasizing the importance of not too readily dismissing injuries of the back as sprains; and sprains of the back that persist should be carefully examined, and, if necessary, X-rayed.

No effort should be made to elicit crepitus in injuries of the cervical region. This should be replaced by the Roentgen ray. In the first-aid handling of the subjects suspected of spinal injury, it is desirable to exercise care and to keep and transport them as much as possible in the position in which they are found, until more definite information as to the nature of the injury is obtained. It seems needless to say that an air or water bed and catheterization under the strictest precautions should be carried out. Shock, which is rarely absent, is the first indication.

The Roentgen ray, spinal puncture, and a careful neurological study are the diagnostic triad upon which we are dependent. The radiogram should be studied stereoptically. The spinal puncture will not only afford data as to the existence of a hematorrhachis, but, through the withdrawal of fluid, will relieve the pressure. It will not permit of a differentiation between a hematorrhachis and hematomyelia. The symptom-complex of both is similar. In meningeal hemorrhage the chief stress is laid upon the irritative phenomenon, acute and immediate spinal pain increased by spinal movement. Radiating pains from the supposed pressure of the blood on the spinal root and referred over their distribution is characteristic, and on it Kocher lays especial stress.

In intramedullary hemorrhage the paralysis is frequently of the Brown-Sequard type, due to unilateral compression, and may increase in keeping with the hematomyelia. The duration of symptoms in hematomyelia is longer than in hematorrhachis, and, owing to the tendency to a syringomyelia, may leave permanent traces.

The examination of the spinal fluid will set at rest the question of infection, should this be suspected.

Nowhere is timeliness more important than in spinal surgery. After the subsidence of shock and the adjustment of the nervous system to a condition where some conclusion can with more safety be drawn, the earlier the operation is performed the better.

Degeneration is by many supposed to begin about the fourth day. In cases in which a careful study justifies the opinion of a complete transverse lesion, or in which it is believed to be a contusion or hematomyelia, operation is contraindicated. In the first instance it is generally considered hopeless, except in the caudal zone, and in the other instance it is useless. Where, however, the evidence is not absolutely convincing, especially after a cautious delay and reasonable doubt still exists, exploration should prevail.

If modern surgery can lay claim to any achievement, it is the elimination of doubt, through cautious exploration, and the fact that some explorations can be shown to be useless, or even a few fatal, does not, in the writer's judgment, invalidate the broad application of the rule.—*Therapeutic Gazette.*

TEN YEARS OF SERUM TREATMENT IN HYPERTHYROIDISM.—Beebe, *Interstate Med. Journ.*, February, 1918, observes that the fundamental premise at the basis of the serum treatment is the assumption that the thyroid secretion during periods of over-activity passes into the circulation in excessive amounts as physiologically active protein. The second premise is the assumption that antiserum can be developed against this protein by inoculating it into an alien species of animal. During the last ten years he states that the antithyroid serum thus prepared has been given to more than 4,000 human patients. Approximately 20 per cent. of all the types of disease do not benefit by serum injections. In 80 per cent. of all patients treated the serum proves serviceable.

The beginning doses administered subcutaneously are small, in most cases from 2 to 4 minims, repeated every second day, gradually increasing the dose until the subject becomes tolerant, reaching in the course of three to four weeks the full dose of 14 to 20 minims. If a full dose of 15 minims is given every day or every second day in the beginning of treatment, the results are almost sure to be disastrous from severe local reactions developing at the point of injection, together with fever. With gradually increasing doses these injections can be made without discomfort. Patients who had injections continued for a period of more than a year during the course of treatment and who remained well for periods of five to ten years seemed a fairly conclusive refutation of the idea that dangerous side effects have been caused in their tissues. In addition to the serum treatment Beebe advises rest—mental, physical, emotional; a rigid meat-free diet, and exclusion of all forms of stimulants, such as tea, coffee, and alcoholics; administration of antithyroid serum; clearing up of all chronic infections; maintenance of hygienic conditions of the intestinal tract; judicious administration of small doses of iodine, always in the form of potassium iodide. This agent is not indicated in all cases, and is used only when the intense overactivity has been controlled.

The proper use at the right period of the treatment of suitable doses of X-ray.

The administration of neutral hydrobromide of quinine in a small percentage of patients during the later periods of treatment.—*Therapeutic Gazette.*

THE INTRAVENOUS SERUM TREATMENT OF EPIDEMIC CEREBROSPINAL MENINGITIS.—W. W. Herrick, *Arch. of Int. Med.*, Vol. 21, November 4, gives a very comprehensive review of recent advances in the study of cerebrospinal meningitis. It is all based on the idea that the disease is primarily a meningococcus bacteriemia with the meningitis as a metastatic process just as arthritis or any other focal lesion. For this reason the intravenous serum treatment is the essential procedure and the intraspinal merely an adjunct, just as serum injections in a joint are used. It is, of course, important to recognze the disease in the early stage of general sepsis before obvious signs of meningitis appear. By special methods the meningococcus has been obtained by blood culture in the early stage in 36 per cent. of cases. The author had an excellent opportunity in the base hospital service to study the earliest symptoms, since all cases of fever, vomiting and headache were promptly hospitalized. It was his aim to make a diagnosis before there were rigid neck, Kernig, and Brudzinski signs. The early symptoms he emphasized especially are: headache in 85 per cent., fever 99° to 101°, peculiar irritability and cyanosis of the face. Pupils are almost always dilated. In a large proportion of cases there is upper respiratory tract infection. The skin manifestations are also important and indicate in a general way the severity of the individual cases. Very early there is a diffuse mottling, giving a lead-colored appearance, then the characteristic petechial rash, which appears most commonly about the shoulder or pelvic girdle. This may appear in crops with astonishing rapidity. Some cases become well dotted within an hour. In the presence of an epidemic such a rapidly developing hemorrhagic rash, the author considers as diagnostic. Next to the rash, reflexes are the most valuable aid. Exaggeration of reflexes unequal on the two sides is a significant change and may appear quite early. He considers the cases under four types; the abortive, the ordinary, the severe and the fulminating. The most brilliant results were obtained in the severe cases by intravenous serum treatment. Intraspinal treatment was also used, but they found that when intravenous serum was used early meningococci rapidly disappeared from the cerebrospinal fluid, and also that complications were less frequent. The author's convictions are summarized in his statement of the transition through which treatment has passed—at first intraspinal therapy alone, then mixed intraspinal and timid intravenous injections, then finally bold intravenous treatment combined with liberal drainage of the spinal fluid and the use of relatively small quantities of serum intraspinally. The mortality in severe cases in which intravenous treatment was used was only 16 per cent. Convalescence was much shorter. Doses of 50 to 120 c.c. are administered by vein, using a large glass syringe. Only one case of severe anaphylaxis was encountered. The whole report is a very convincing statement in regard to the newer conception of cerebrospinal meningitis, but as the author states it is a medical emergency in which prompt diagnosis and treatment are life-saving measures.—*Cleveland Med. Journal.*

EXPERIMENTAL NEUROLOGY.

ELETROCARDIOGRAPHIC OBSERVATIONS IN TOXIC GOITRE.—Krumbhaar, *Amer. Jour. of Med. Sciences*, February, 1918, made electrocardiographic studies of 51 cases of goitre, mostly of the toxic type, in as many cases as possible both before and after surgical operation.

In the series of 47 patients that submitted to surgical operation (ligation, partial excision and enucleation of adenomata) three deaths occurred. Two of these offered no premonitory sign in either clinical or electrocardiographic examination; in the third case the development of negative T-waves might have served as an adequate warning.

Electrocardiograms, essentially normal as to form and rhythm, were found in 22 cases (43 per cent.). Preponderating hypertrophy of the right ventricle (or a tendency thereto) was found in 11 cases, and of the left ventricle (or a tendency thereto) also in 11 cases. After operation, however, one-half of the right ventricular cases showed a diminished degree of preponderance, whereas all but one of the left ventricular cases showed either no change or an increased amount of preponderance.

Cardiac arrhythmia was found as follows: sinus arrhythmia, 4 cases; ventricular extrasystoles, 3 cases; auricular fibrillation, 3 cases; auricular flutter, 1 case; delayed conductivity, 2 cases. Two of the cases of fibrillation and the case of flutter proved constant over several years. The other case of fibrillation was of the transient kind and disappeared coincidentally with the improvement that followed medical treatment.

The T-wave was found to be unusually prominent in most cases. In about half the cases it was markedly and persistently diminished after operation. This was found to be true to a less degree in postoperative cases with normal hearts. Other changes in form of the ventricular complex after operation indicated an approximation to normal cardiac mechanism.

Blood-pressure estimation showed an increased pulse pressure in most cases, which was diminished with the improvement that followed surgical relief. Systolic pressure was also high in those cases that showed left ventricular preponderance, but never exceeded 170 mm. Hg.

In the early cases of toxic goitre the characteristic tachycardia is not accompanied by any signs of myocardial change that are demonstrable with the string galvanometer.

With persisting overaction of the heart, hypertrophy of either ventricle may become manifest.

Progressive hypertrophy and overaction result in myocardial degeneration that may be manifested by any type of cardiac irregularity: sinus arrhythmia, premature contractions, auricular flutter, auricular fibrillation, heart-block, etc.

If the existing intoxication is the chief factor in the production of the arrhythmia this may disappear with removal of the intoxication.

Successful treatment, whether medical or surgical, improves the cardiac condition by this means. This is shown not only by the occasional disappearance of an arrhythmia but also by diminution in the size of the T-wave and in the pulse pressure as well as by the general clinical condition.

The development of diphasic or inverted T-waves should probably be considered as influencing prognosis unfavorably.—*Therapeutic Gazette.*

EXPERIMENTAL MENINGOCOCCUS MENINGITIS.—Charles R. Austin, *Johns Hopkins Bulletin*, August, 1918, in a series of experiments upon twenty rabbits, formulates the following conclusions:

(1) The cerebrospinal canal can be infected by way of the blood stream.

(2) Though under normal conditions the presence of a bacteriemia does not lead to the development of meningitis, when a condition of hyperemia of the thecal vessels exists, meningeal inflammation may result.

(3) Neither when normal conditions are present nor when meningeal irritation has been induced do meningococci introduced into the nasal mucous membrane gain access to the meninges.

(4) The demonstration of meningococci in the nasal secretion is to be interpreted as evidence of the excretion of these organisms by this route, but the conclusion is not necessarily warranted that they find a direct portal of entry to the meninges by the same channel.

These observations seem important from an etiological standpoint. They indicate the probability that epidemic cerebrospinal meningitis, as it occurs in man, is to be regarded as a metastatic disease developing in the course of a general infection, rather than as the evidence of a primary local disease. They do not necessarily indicate the portal of entry of the invader, nor antagonize the view that the cocci are taken into the body through the upper respiratory tract, a fact apparently established.

The observation that meningococcal sepsis in rabbits is followed by the development of meningeal disease only when the meninges are not in a normal state is suggestive and may explain in part, at least, the occurrence of the disease in some of those exposed and its failure to develop in others in like contact with sources of infection.

EXPERIMENTAL PSYCHIATRY.

RESULTS IN TREATMENT OF PARESIS BY INUNCTIONS OF MERCURY AND DRAINAGE OF THE CEREBROSPINAL FLUID.—Alan D. Finlayson, *American Jour. of Insanity*, April, 1918, observes that as a result of a known etiology and accurate means of diagnosis serologically there has been a marked increase in the interest in the treatment of paresis.

Some of the methods of treatment have not proved as successful as one might wish, nevertheless, physicians dealing with this great problem are working energetically with prospects of results.

All observers are of the opinion that if paresis is to be successfully combated it must be diagnosed early and treated energetically. The agents most in favor for the past few years have been salvarsan and neosalvarsan, and, since the war shut off the supply of these, arsenobenzol and diarsenol. The two great obstacles in carrying out the foregoing advice of early diagnosis and energetic treatment are, first, the scarcity of men who are sufficiently trained to recognize the early manifestations of the disease and sufficiently skillful to use the agent when the diagnosis is made; and, second, the financial inability of a vast number of patients to secure the treatment. These obstacles do not obtain in large centers where skilled diagnosticians reside and where dispensaries supply the medicinal agents free or at a nominal price.

The author having obtained indifferent results from the intraspinal treatment of paresis with salvarsan, undertook to investigate the use of mercurial inunctions with drainage of the cerebrospinal fluid because of the favorable reports of Gilpin and Early.

In all, 20 patients were treated. Fourteen of these were selected for this report; the others were not tabulated because the patients were discharged from the hospital or died less than four months after treatment was begun, and it seemed that this period was a minimum length of time on which to make observations. The investigation covered by this report extended over a period of 15 months, although all of the patients were not under treatment during the entire time.

The method pursued was similar to that of Gilpin and Early, but differed in that the patients were given daily inunctions of mercurial ointment 50 per cent., beginning with a dram and gradually advancing to three drams. The surface of the body was divided into eight areas, and the different areas used consecutively so as to avoid an unnecessary dermatitis in those susceptible. In this way any given area was used only once in eight days. When the amount of mercurial ointment used reached three drams daily, considerable difficulty was experienced in making the skin absorb it. To overcome this two areas instead of one were used each day. One patient reacted with such a violent dermatitis that the treatment had to be abandoned for several months. Later, no such reaction occurred, and the treatment was resumed.

The spinal fluid was withdrawn at approximately ten-day intervals. From 20 c.c. to 50 c.c. were withdrawn, the amount depending on the pressure and rapidity of the flow. The first 5 c.c. were reserved for serological examination and the remainder for chemical tests for the presence of mercury. The routine observations were: On the blood, the Wassermann reaction; on the spinal fluid, a Wassermann reaction, globulin test, cell count, and colloidal gold reaction. The spinal fluid used for the cell count was the first withdrawn, and was diluted at once in a red cell pipette 1-100 with acetic acid tinted with methyl violet and throughly shaken. In the Wassermann tests on the blood and spinal fluid the technic observed was that reported in detail by Weston. When the term positive is used ++++ (four plus) is meant. In testing the spinal fluid for mercury, only minute amounts were expected, so that the spinal fluids of the patients were grouped to the amount of 500 c.c. and this tested. The method of Vogel and Lee was used to determine the presence of mercury.

Short abstracts of the cases treated are given, together with tables of the serological findings during treatment.

Recently Akatsu and Noguchi have shown that the Treponema pallidum develops a resistance to mercury equal to 35 to 70 times the original fatal amount. It is possible that in this series of cases the Treponemata became immune to mercury, and this might explain the negative results of the treatment.

It is interesting to note the enormous amounts of mercury which these patients tolerated without having suffered from salivation. Of the 14 cases only eight showed salivation; the time required to reach this condition varied from a minimum of three weeks in one case to a maximum of 15 months in another. Of the five cases who died while under treatment, none showed any evidence that the medication was a contributing factor in the death.

It is a generally accepted theory that Wassermann reactions made while the patients are receiving active mercurial treatment are of little value because the mercury absorbed causes a positive serum to react negatively. In this series positive Wassermanns were obtained from cases before and during salivation, and, on the other hand, negative results were obtained from cases which were never salivated. One patient who was receiving daily inunctions was transferred to another ward and by accident the treatment sheet was not transferred with her. Treatment was consequently omitted for a period of two weeks. For ten weeks prior to this time most of the reactions were negative, but following the omission of the treatment the next examination showed a positive globulin test and a return of the paretic curve with the fluid. When treatment was resumed the reaction again became negative with the exception of an occasional positive Wassermann in the blood.

Several examinations on the group spinal fluid were made in order to determine the presence of mercury, but it was found only in the last one, at about the end of the period of observation. Only a trace of mercury was found.

The writer fully appreciates the fact that some of the cases in this report were too far advanced to permit of any optimistic outlook for them, but the negative serological results obtained in even these strengthens the belief that marked benefit may be derived by this form of treatment if the disease is diagnosed early and intensively treated.

Following is a brief summary of the findings:

Fourteen paretics, who had been showing symptoms from nine months to several years received daily inunctions of mercurial ointment 50 per cent. Every tenth day a lumbar puncture was made and from 20 c.c. to 40 c.c. of fluid withdrawn, the amount depending on the pressure and the rapidity of the flow. A Wassermann reaction was done, using the blood serum; a globulin test, cell count, Lange's colloidal gold test, Wassermann reaction and a chemical test to determine the presence of mercury were done, using the fluid. In seven, or 50 per cent. of the cases the blood Wassermann became negative and remained so for varying periods of time; one case had a negative blood at the time of admission and it remained so throughout the period of observation. In 6, or 43 per cent. of the cases, the spinal fluid became negative and remained so for varying periods of time. In no instance did the blood or spinal fluid become negative and remain so. All cases had negative globulin tests at one or more examinations, but, with the exception of one case, more positives than negatives were obtained. The cell count showed an irregular decrease in all instances. In 4, or 28 per cent. of the cases, the colloidal gold became negative, that is, was neither paretic nor luetic in type, but all showed "paretic curves" at some later examination. After 15 months' treatment a trace of mercury was found in 500 c.c. of grouped spinal fluids. No mercury was found on previous examinations.

One case showed a good remission mentally, but all the serological findings remained strongly positive. Another case did not improve quite as much, but approached a state termed a remission, and has shown some negative serological findings. The remaining 12 cases showed no greater mental or physical changes than would be found in a similar group of untreated cases. The lack of correlation between the serological findings and mental conditions leaves little ground on which to base definite conclusions as to the value of the treatment.

EXPERIMENTAL PSYCHOLOGY.

A Study of Blood Pressure in the Insane.—Dean C. Brown, *The (Ill.) Institution Quarterly*, studied the blood pressure in 400 cases in the Peoria State Hospital for the purpose of ascertaining its value as an aid in diagnosis of the various types of insanity, as well as to discover the relation of blood pressure to dementia praecox, although he expresses the belief that the number of cases of the latter class were insufficient to admit of deductions.

After tabulating the series and discussing the findings in each class, the author epitomizes his conclusions as follows:

1. We find slightly raised blood pressure in the chronic alcoholic.

2. Arteriosclerotic dementia is probably a larger class than at present recognized.
3. There is a slightly reduced blood pressure among dementia praecox patients.
4. All manic depressives show increased pressure. Manics greatest—depressed the least.
5. Large numbers of those diagnosed senile dementia should properly be called arteriosclerotic.
6. Withdrawal of spinal fluid tends to reduce blood pressure immediately.
7. All patients in a state of depression show considerably reduced blood pressure.

NEURO-PATHOLOGY.

THE NEW PATHOLOGY OF SYPHILIS.—Albert Scott Warthin, *American Journal of Syphilis*, July, 1918, in an elaborate study of 750 autopsies, in which evidence of syphilitic infection was found in 300 cases, or 40 per cent. of the autopsies, presents the following summary:

1. The gumma is not the essential typical lesion of old or latent syphilis. It is a relatively rare formation; and the great majority of cases of syphilis run their course without the formation of gummatous granulomata.
2. The new pathology of syphilis is based upon the demonstration that the essential tissue-lesion of either late or latent syphilis is an irritative or inflammatory process, usually mild in degree, characterized by lymphocytic and plasma-cell infiltrations in the stroma particularly about the blood vessels and lymphatics, slight tissue proliferations, eventually fibrosis, and atrophy or degeneration of the parenchyma.
3. These mild inflammatory reactions are due to the localizations in the tissues of relatively avirulent spirochetes.
4. Syphilitic inflammations of this type occur in all tissues and organs; but are most easily recognized in the nervous system, heart, aorta, pancreas, adrenals and testes. They are, however, usually widely distributed throughout the entire body, although in individual cases showing especial predilection for certain organs or tissues. No explanation of these system, organ, or tissue predilections is yet evident; neither is there any explanation of those cases in which all organs and tissues show the most severe degree of these lesions.
5. The syphilitic is a spirochete carrier. In this respect, the Spirochete pallida is to be classed with the trypanosome, the malarial organisms, lepra and tubercle bacilli, streptococcus, etc.
6. Syphilis tends to become a mild process; but at any time the partnership between the body and the spirochete may become disturbed, and tissue susceptibility or virulence of the spirochete become increased so that the disease again appears above the clinical horizon.
7. Immunity in syphilis depends upon the carrying of the spirochete. A price is paid for this immunity in the form of the defensive inflammatory lesions previously described.
8. The disastrous effects of syphilitic infection usually require a period of years for their development. The slowly progressive lesions, fibrosis and atrophy, may at last manifest themselves in paresis, tabes, myocarditis, aortitis, aneurysm, diabetes, hepatitis, or in many other forms of tissue damage and functional disturbance. Lesions of the viscera are much more common and important clinically than those of the central nervous system, but they are rarely recognized as syphilitic by the clinician. Syphilitic death occurs most frequently in males between the ages of forty and sixty. Chronic myocarditis is the most common form of death due to syphilis.
9. The pathologic diagnosis of syphilis is essentially microscopic. Only in a

relatively small number of cases are the gross lesions (tabes, gumma, aortitis, etc.) typical enough to be recognized by the naked eye. A negative diagnosis of syphilis cannot be given with any certainty without a routine microscopic examination of all organs and tissues, but particularly of the left ventricle wall, the aorta, both its arch and abdominal portion, the testes, pancreas and adrenals.

NEURO-SURGERY.

CORD INJURIES IN SPINAL FRACTURES.—Norman Sharpe, *American Journal of Surgery*, August, 1918, writes that until the last few years surgeons generally were of the opinion that the proper treatment of fracture of the spine with symptoms of partial injury to the cord, in the absence of bony deformity, or of determinable loose fragments of bone, was to defer operation until the cord had made what repair it could, or until improvement had come to a standstill; and that fracture with complete abolition of function below the injury, apparently proved a complete cord lesion and no operation was justifiable.

This stand was taken by surgeons for two reasons: (1) It was generally believed that all the injury to the cord was immediate, received at the time of the fracture. Therefore as lacerated cord fibres do not regenerate, early operation was useless. (2) Laminectomy was a fairly dangerous operation.

Many surgeons still adhere to the opinion that in the great majority of cord injuries following fracture it is better to delay operation for periods of time varying from weeks to months. This stand is not justified in this day, and cannot be defended on theoretical, experimental or clinical grounds.

Fractures of the spine without cord injury are rather numerous.

Fractures with cord injury may be divided into two classes: first, fractures with symptoms of partial abolition of function, and, second, fractures with symptoms of immediate complete abolition of function.

In fractures with signs of partial lesions of the cord, the opponents of early operation have maintained that the damage to the cord is immediate following the injury, that laceration of the cord cannot be remedied by laceration and that the nerve fibres, if severely injured, degenerate whether compression is immediately removed or not. That removal of pressure by early operation will not cause the already destroyed fibres to regenerate is true. But the opponents of early operative interference have overlooked the fact that in fracture with damage to the cord, there are other factors harmful to the nerve fibres in addition to the damage received at the moment of injury. The immediate damage is due to fragments of displaced bone causing contusion or laceration of the nerve fibres, or a narrowing of the canal by the fractured laminae or a projection backward of a vertebral body causing compression of the cord. In these cases the symptoms of cord injury arise immediately after the accident. Other factors are:

1. Hemorrhage, either into the cord substance, causing laceration of the fibres or hemorrhage around the cord, either intra- or extra-dural, causing compression of the cord. In these cases the symptoms come on slowly, may be hours after the injury, and are usually progressive.

3. Edema both within and around the cord, causing compression of the fibres. In itself edema gives rise to symptoms that appear, like those due to hemorrhage, some hours after the accident, and these symptoms are progressive. This edema, present after every injury to the cord, and by its compressive effects so destructive to the nerve fibres, forms one of the chief reasons for early operation. Its power to harm has been overlooked in the past and recent operations have shown that in many cases, signs indicating injury or compression of bone are really due to the compressive and destructive effects of the edema.

A factor later appearing is narrowing of the spinal canal at the site of injury by new bone growth or the formation of scar tissue; here the symptoms arise months after the injury.

These factors operate singly or in combination. It is only in rare cases and in the slighter injuries that these factors operate singly. In the majority of fractures of the spine, two or more, and at times, all of these factors are seen. In fractures with laceration or compression of the cord by displaced bone, there is usually hemorrhage in or around the cord, it is always followed by edema, and often later by narrowing of the cord space by new bone growth or scar formation. In nearly every case one factor such as compression by bone, or hemorrhage in or about the cord so predominates as to render the other factors negligible for the time being, though later these other factors will add their quota to the sum total of the symptoms, and have a strong effect on the outcome. In partial lesions of the cord there are found destroyed, damaged and sound fibres side by side. Of the destroyed fibres nothing is to be expected; they will not regenerate. The fate of the damaged and of many of the sound fibres, depends on whether the factors producing the injury are temporary or permanent. These factors are compression by bone, blood and the certain edema which appears after every injury to the cord. If this compression is quickly removed not only will the sound fibres be preserved but functional and even anatomical repair will take place in many of the damaged but not destroyed fibres. But if compression due to any or all of the above mentioned three factors is at all severe and is allowed to continue for as short a period as four days, not only will secondary degeneration appear in the damaged fibres but many of the sound fibres will also be involved. If operation is not done early, compression by bone, by hemorrhage or the quickly following edema may work permanent harm. Interruption of conductivity of nerve fibres after fracture does not necessarily mean that those fibres are destroyed. In practically every case of partial injury to the cord many of the interrupted fibres will later functionate, and it is to preserve the integrity of the sound fibres and to give the best chance of recovery to the damaged but not destroyed fibres that early operation is urged. If these symptoms occurred in a structure of greater reparative power than the cord, a delay in operation would be justifiable in order to permit of recovery of the fibres from the initial injury, but delay with tissue so feebly resistant as the cord in the presence of continued compression by bone, hemorrhage or edema, may cause permanent damage. In former years laminectomy was a formidable procedure, and operation was delayed on this account, but with the present-day improvement in technic and asepsis, the danger of laminectomy in skilled hands is but slight in comparison to the possible benefits.

Compression of cord fibres by edema will not be relieved unless the dura is freely opened, which should always be done.

Many surgeons contend that early laminectomy adds insult to an already damaged cord, and yet these surgeons advise in midcervical fractures, with danger of involvement of the fourth cervical segment, immediate operation to prevent respiratory troubles.

Even though the symptoms of cord injury are but slight, if they are progressive, laminectomy should be done and the dura opened to allow of drainage or whatever hemorrhage may be present and to ward off by this spinal "decompression" the effects of the edema which invariably follows injury to the cord, and which is so destructive to the delicate fibres.

Fracture with symptoms of immediate, complete abolition of function. It is in this type of fracture that the opinion of surgeons is most sharply divided as to the advisability of operative interference. Many hold that immediate complete motor and sensory paralysis, with abolition of all reflexes below the lesion and loss of sphincter control, shows a total transverse lesion of the cord, and laminectomy is unjustifiable and can do no good. This would be true did the above symptoms positively indicate, as they do in many cases, complete destruction of the cord. But there have been many cases reported in which all the above symptoms were present and were considered complete lesions of the cord, in which later partial function returned even without operation, and many reported in which operation was followed by fair recovery.

The Bastian-Bruns, so-called, law, which is that there is a total loss of tendon reflexes in complete lesion, is, as an aid in diagnosis, only of value in a negative sense. That is, the presence of reflexes makes it certain that there is not a total lesion, while the absence of reflexes is not proof that the lesion is total unless such absence is persistent. In many cases of partial lesion there is a total loss of reflexes for more than eight days; so that there are no symptoms short of a deformity at the site of injury so great as to show complete obliteration of the spinal canal.

The author believes early laminectomy in skilled hands is the best treatment by far in fracture of the spine with cord lesions, and the only contraindication to operation is a bony deformity so great as to show beyond doubt that the spinal canal is obliterated and the cord hopelessly crushed.

The operation should be performed as soon as the patient has reacted from the shock and the site of the lesion localized. A free opening of the bony canal will relieve compression by bone, whether due to driven-in laminae or a backward projecting vertebral body causing angulation of the cord. If a projection presses against the cord in spite of the removal of the laminae, sufficient bone can be chiseled or ronguered to give the cord ample room. A free opening of the dura will permit of removal and drainage of blood, and will offset the compression of the following edema. The dura may be reclosed or not, as indicated by the condition of the cord. In many cases it is best left open. In cases with paralysis of the bladder, *catheterization should never be attempted. If it is done, the resulting cystitis will carry off 50 per cent. of the cases.* Massage of the neck of the bladder, or hot rectal injections, will usually be found efficacious.

The writer believes that suture of a severed cord should be attempted. If the ends cannot be approximated and the lesion is in the dorso-lumbar region—an attempt should be made to unite the roots above and below the lesion, as suggested by Kilvington. This cannot be done in the upper dorsal or servical regions, because of the short course of the roots in the canal.

There has been and still is a wide divergence of opinion among surgeons, as to the propriety, and as to the proper time of operating on these cases of cord injuries in spinal fractures. The divergence of opinion is largely due to the fact that laminectomy has been regarded as a dangerous operation. But with our present-day technic and asepsis, this is no longer true.

Therefore, in every case of fracture of a spine with damage to the cord, excepting only complete obliteration of the bony canal, an early laminectomy is urgently indicated to relieve the cord of the damaging effects of bone-pressure, hemorrhage, and edema, and to give the nerve tissue the best possible chance for repair.

TRAUMATIC "PALSY" OF THE UPPER EXTREMITY IN CHILDREN.—Jacob Grossman, *Charlotte Med. Journ.*, writes that traumatic palsy of the upper extremity is a condition occurring especially in children. It is usually the result of dragging or lifting the child suddenly by the wrists or forearm, thus jerking the upper extremity violently, and is characterized clinically by an apparent palsy of the upper extremity, disability and pain.

The pathological lesion present is one in which there is a partial dislocation of the head of the radius usually accompanied by the tearing of a few fibres of the annular ligament. The surrounding tissues are damaged slightly or not at all, as swelling, ecchymosis and other signs of a severe injury are wanting. Adhesions rarely form in the periarticular structures or in the elbow joint. As far as can be determined from a clinical viewpoint there is a complete return to the normal in the tissues affected. Fracture of the head or neck of the radius or separation of the epiphysis of any of the bones entering into the formation of the elbow joint never occurs.

The history obtainable in these cases is characteristic. The child is raised by the wrist, or as in a number of instances refuses to obey its parent or guardian and is forcibly dragged by the wrist, or he attempts to run away from his parent or guardian and is suddenly dragged back by the wrist. Immediately thereafter there is disability and pain. The pain appears general and not localized in any definite area. The limb hangs limply at the side and the child is unable to move it. The mothers are ignorant of the exact location of the injury, referring it to the wrist in a large number of instances. The child refuses to use the entire upper extremity. All active movements of the forearm are absent. Passively, flexion and extension of the wrist and elbow are free and painless. Passive supination and pronation are restricted and painful. Ecchymosis and the other cardinal signs of fracture are absent. At the extreme of passive supination a clicking sound, such as is commonly heard when a dislocated bone is replaced to its normal position, is discernable and immediately thereafter or within a very short period, there is complete return of function in the limb. The child graps for any object which is placed before it, flexes and extends, supinates and pronates the forearm voluntarily. The pain which was present disappears. It is interesting to note the rapidity with which the limb returns to the normal after the reduction of the dislocation of the head of the radius, is accomplished.

The differential diagnosis of this condition is not very difficult. The history and the clinical picture are distinctive. The most important condition that must be differentiated is infantile paralysis. The symptoms of the onset of the latter, followed by paralysis usually of the deltoid muscle and occasionally of any of the other muscles of the arm or forearm, the marked atrophy and the presence of the reaction of degeneration makes the diagnosis of infantile paralysis very evident. Fracture of any of the bones entering into the formation of the elbow can be eliminated by the absence of the cardinal signs and symptoms of this condition. The Roentgen ray will also assist in eliminating fracture. The Roentgen ray picture in traumatic palsy as a rule fails to disclose any pathological lesion.

The prognosis is excellent. Once the dislocation of the head of the radius is reduced, there is no impairment or permanent injury to the elbow joint. The condition does recur and the parents should be warned about dragging their children or lifting them by the wrists.

The treatment is very simple. After reduction, the elbow is immobilized for a period of twenty-four hours by means of flannel bandages; thereafter immobilization can be discontinued and the child permitted to use its elbow. As a rule the convalescence is uneventful.

In concluding it would be well to emphasize that the most important points to be remembered about this condition are, first the typical history, *i. e.*, dragging the child or lifting him by the wrists, second, the characteristic clinical picture, an apparent flaccid paralysis of the upper extremity and, finally, the immediate return to the normal after the reduction of the dislocation of the head of the radius has been accomplished.

NEURO-SYMPTOMATOLOGY.

THE SYMPTOMS OF ACUTE CEREBELLAR INJURIES DUE TO GUNSHOT INJURIES.—Gordon Holmes, *Brain*, 1918, XL, 461-531, in a lengthy, technical, but important monograph, thus discusses unilateral lesions of the cerebellum, which is the part here abstracted.

The effects of cerebellar injury fall almost exclusively on the motor system. In the early stages one of the most prominent symptoms is loss or diminution of tone in the muscles of the same side of the body as the injury. The involved muscles feel flabby to the examiner and are more easily displaced transversely and compressed. They can be stretched to a greater extent without discomfort to the patient. Not infrequently the hand will be observed lying for long periods prone on the bed with the fingers hyperextended in a seemingly very uncomfortable position. If both forearms are held vertically by the observer, the wrist on the affected side usually falls passively into a position of extreme flexion, while in the normal limb the wrist is not allowed to become more than semiflexed. There is definitely less resistance to passive motion. The joints swing free until they are suddenly locked by their bony and ligamentous structures. If the arm is held out horizontally and is gently tapped, the well arm is only moderately displaced and immediately resumes its former position; while the affected arm offers less resistance to displacement, is arrested less abruptly, and is slower in its return to its former position.

There are certain disturbances of voluntary movement as asthenia, ataxia, the rebound phenomenon and adiadochokinesis.

The asthenia is shown by the feebleness of voluntary acts. Dynamometric measurements show a marked difference in the two sides. The affected limb tires more easily. Often, as in walking, there is a sudden giving away of the limb. There is an unconscious reluctance to use the affected limb where choice is presented. The movements are slow, which may be apparent when weakness cannot be made out. This slowness affects both initiation of the movement and its development to its maximum, delays relaxation both in its initiation and completion. The weakness generally diminishes gradually. Cerebellar weakness is distinguished from that of cerebral-cortical or cortico-spinal tract origin by the uniform and approximately equal affection of all groups of muscles, by the fact that while all muscle voluntary movements are weak, none are limited in range, by the absence of the characteristic alterations in the reflexes and by the fact that there are no contractures or rigidities.

Ataxia resolves itself into several components; decomposition of movement, asynergia, dysmetria, tremor and deviations from the line of movement.

Decomposition of movement: It we ask a patient to lie in bed and extend his arm vertically over his face and then bring his forefinger to his nose, it is seen that instead of depressing his arm and flexing his elbow simultaneously, he first brings his elbow towards the bed, and only when it is there does he approach his finger to his nose. In other words, he decomposes the movement. He performs the separate movements that constitute an act by "numbers," as in a gymnasium.

Asynergia refers to the disturbance of the proper synergic association in the contraction of agonists, antagonists and fixating muscles. For example, when the fingers are flexed, the extensors of the wrist normally contract synergically with appropriate force in order to prevent simultaneous flexion of the wrist, but if a patient with a cerebellar lesion grasps a small object quickly, it often happens that the wrist of the affected side is extended excessively or too early, so that the hand is bent backwards when the fingers are but half flexed.

Dysmetria denotes that the range and force of the movement are not proportional to their aim, e. g., in bringing the finger to the nose it either shoots past or stops too soon.

Tremor is more common in the later stages; it may be completely absent in the early stages.

Deviations from the line of movement is important, and has often been overlooked. As the limb is raised it sways, deviates from its proper course, and towards its completion does not come straight to its object. One patient would bring food to his ear. Another was afraid to smoke, holding the cigarette in the affected hand, because he would tend to get the cigarette in his eye.

The rebound phenomenon. The patient's elbows are supported on a table and he is asked to pull each hand in succession towards his mouth, against resistance offered by the observer who grasps his wrists; when this resistance is suddenly released the hand of the affected side flies to his mouth or shoulder, often with considerable violence, but the movement of the normal limb is arrested almost immediately by contraction of the antagonists, and may even jerk back or rebound. As a rule this phenomenon is equally pronounced at other joints. It is more pronounced in the early cases, and when the hypotonia is greatest.

Adiadochokinesis. A patient with cerebellar disease is almost always unable to execute alternate movements rapidly. It may be tested at any joint where normally such movements are performed as flexion and extension, pronation and supination, etc.

Holmes has never observed static tremor where there is full relaxation and support, but it may be simulated where the posture assumed requires muscular contraction. In sitting or standing there may be tremor of the head, or the whole body may sway. After the arms, *e. g.*, are once outstretched they often are held with less tremor than the sound limb, *i.* e., until they get tired, which they do early.

Vertigo. Giddiness is extremely common after gunshot injuries of any region of the head. Seventeen cerebellar cases described apparent displacement of self, or of external objects, or both (12). The vertigo rarely persisted for more than one or two days. In almost all of the cases the subjective and objective rotation were in the same direction. Where actual movement accompanied the sensation, it took place from the affected toward the sound side.

Spontaneous deviation of the limbs and Barany's test. The patient is asked to hold both arms extended horizontally in front of him and to close his eyes. Then in the majority of cases the homolateral limb swings either abruptly or slowly away from the symmetrical position and comes to rest gradually. This occurred in all the unilateral cases in which it was looked for. Barany's pointing tests confirm these observations. The patient's forefinger is placed in contact with some fixed object held at some distance from the bed. He is then asked, while his eyes are closed, to bring his finger down slowly to the bed and then back again to the object. On the affected side the finger deviates constantly, and this deviation increases for a time if the test is continued. Tested in the horizontal plane the deviations are much less constant.

Attitude. Abnormal attitudes, which are such a prominent feature in animals after experimental ablation of portions of the cerebellum, are much less constant and striking in man. As a rule the head tends to be flexed towards the side of the wound and rotated towards the opposite side, so that the chin approaches the contralateral shoulder, and the occiput is approximated towards the shoulder of the affected side. The trunk is often concave to the side of the lesion, and there may be a tendency to rotate to the unaffected side. The flaccid and hypotonic limbs generally assume any posture into which they happen to fall or are moved.

Standing and Gait. Placed on his feet the patient is shaky, uncertain and unsteady, his whole body sways irregularly, his head oscillates, and usually he tends to fall towards the side of the wound and backward. It often seems as if he were impelled to that side, as though by an invisible hand. His attitude is striking—his head and trunk are inclined to the injured side, his spine is concave to it, but his pelvis is so tilted that his weight falls chiefly on the sound foot. The homolateral foot is usually abducted and sometimes rotated outwards. His whole body is held stiff and rigid. If gently pushed he can be more easily pushed to the side of the lesion, and he makes less appropriate effort to save himself from falling. It must be emphasized that the patient can stand as securely with his eyes closed as when they are open: *i.* e., there is no tendency to Romberg's sign. On walking he has much difficulty in preserving equilibrium. He fears to trust himself on the affected leg. He throws his weight on it cautiously and slowly and hurries off of it by quickly bringing up the other leg. He tends to stumble to the homolateral side, and in trying to walk a straight line, deviates to the affected side. If a chair is placed at his injured side, he walks around it in a closing spiral; if placed to the sound side, he will walk in an opening spiral.

Ocular movements and nystagmus. For the first few days the eyes are deviated to the opposite side, especially if the patient is unconscious. The range of motion is usually limited on attempted conjugate motion towards the injured side. Skew-deviation was observed in five cases. Nystagmus is present in almost every case. In can be seen usually only if the patient fixes an object. Looking at an object held in front of him his eyes tend to deviate towards the unaffected side slowly, and are brought back to the middle line by sharp jerks of small range. It is on looking to the injured side that the nystagmus is most marked, with wide slow deviations to the rest point, and forcible jerks of wide amplitude, slow in rate, and regular in rhythm, to the object held on the injured side. On convergence both eyes tend away from the lesion, and come back with irregular jerks. Nystagmus persists for weeks and months.

Disturbances of speech. Speech is abnormal in most cases in which the lesions are severe and recent; it is usually slow, drawling, and tends to be staccato and scanning. It is sing-song and difficult to understand. The attempt to utter a series of syllables is associated with excessive facial grimacing.

The reflexes. Striking alterations in the reflexes are not prominent or obvious to clinical observation. Tracings on a smoked drum show that the knee jerk has no prolongation of its latent period. In the normal curve the fall of the leg is slower than the rise, due to the action of the extensor muscles. In cerebellar injury the fall is the more rapid phase. Also the falling limb acquires sufficient velocity to give it a number of oscillations which have all the features of those of a pendulum. The normally palpable contraction of the hamstring tendons cannot be felt.

Sensation. Holmes has never found a disturbance of any modality of sensation and he concludes that no form of sensation is disturbed.—*Cleveland Med. Journ.*

THE SYMPTOMATOLOGY AND DIAGNOSIS OF WOUNDS OF THE SPINE AND CORD IN WARFARE.—Charles Greene Cumston, *Albany Medical Annals*, August, 1918, discusses the symptoms due to medullary or radicular lesions when the cord or its roots have been injured or compressed by war missiles, accompanied or not by fracture of the spine.

The cord is an organ of transmission of centripetal and centrifugal motricity and sensibility, trophic center and the center of sphincteric reflexes, so that the study of the disturbances of each of its functions must be made when the neuro-axis has been injured or compressed; per contra given the medullary systematization in both the vertical and transversal directions, it is evident that some of these disturbances may be absent. Therefore, the medullary lesions must be studied (1) from the viewpoint of their transversal extent (hemi sections and partial lesions); (2) from the viewpoint of their vertical direction (systematization in the vertical direction), a most important point for the diagnosis of the seat of the missiles.

From the clinical standpoint, it is essential to distinguish two syndromes, namely: (1) the syndrome of division, and (2) the syndrome of irritation or compression.

From the pathological standpoint, two conditions are met with, viz: (1) total division and (2) partial section, each of which possesses a different clinical picture.

Total division is characterized by a flaccid paralysis, abolition of muscular tonus, a quadriplegia or paraplegia according to the location of the lesion; as the patient lies, the lower limbs are in complete extension and if they are raised they fall heavily; muscular resistance is *nil;* sensory paralysis is absolute and usually assumes a metameric topography, varying according to the seat of the lesion in the cord and giving rise to all types of anesthesia—contact, pricking, baresthetic sensations, deep-seated sensibility, muscular sense and sense of muscular position. Therefore, all kinds of sensibility have disappeared, but usually disturbances of subjective sensibility are absent, *i. e.*, pain, excepting in cases of compression of the roots connected with the cord *above* the lesion.

All the reflexes are absent (plantar, tendo Achilles, patellar, abdominal and cremasteric), as well as those of the upper limb when the lesion is situated in the cervical region. The study of the reflexes is most important for localizing the lesion, although confronted with two contradictory theories, the first of which is the theory of *short tracts*.

The brain, according to this theory, possesses an inhibiting action on the cord. If the cord is divided between the reflex center and the brain the reflexes should be increased. This theory, which was formerly almost generally admitted, has been practically discarded by all clinicians.

The second theory is that of Charlton Bastian. When the cord is completely divided, all normal tendon reflexes are abolished below the section. If division is incomplete, the condition of the reflexes is different. In total division of the cord, the sphincters are paralyzed, this being made evident by incontinence of urine in the true sense, or in the case of bladder paralysis, by overflow. The stools are passed involuntarily, while to these manifestations, erection becomes added, but when this occurs, the sphincteric phenomena cease.

Trophic disturbances. The cord may retain its vitality *below* the lesion, in which circumstance there is no immediate muscular atrophy nor reaction of degeneration, excepting in muscular groups having their trophic neurons situated above the point of division. The only atrophied muscles are those whose neurons are involved in the division or lesion of the cord. However, cutaneous trophism is profoundly disturbed and bed sores rapidly develop in spite of every care.

Usually there are no trophic disturbances of the hair or nails.

In total division of the cord an improvement is almost out of the question, but should it occur, a marked muscular retraction takes place, but generally the sensitive and reflex paralytic disturbances persist. There will be an aggravation of the urinary disturbances, with ascending infection of the urinary tract and the patient dies from renal infection. Quite recently, De Sarlo has recommended suprapubic cystostomy in order to avoid this ascending infection. The idea is good theoretically, but the author is unaware of the practical results.

The trophic disturbance may become aggravated and the sacral bed-sore, attaining enormous proportions, undergoes necrosis, ending in an opening into the spinal canal and death from meningitis and myelitis.

When division of the cord is incomplete there may be hemiplegia. It is of the limp variety, while the paralysis of the limbs is on the side of the lesion. If the latter be located high up on the cord, the intercostals and diaphragm will be paralyzed, but facial integrity is always preserved in spinal hemiplegia.

There may be a total or dissociated monoplegia of the same type, this assuming the radicular type, at times superior, at others inferior (for example, paralysis of the hand and forearm, or the shoulder and arm). In the case of hemisection of the cord, the paralytic manifestations are located on the side of the lesion, while those of the sensibility realize Brown-Sequard's syndrome, namely: on the side of the lesion there is cutaneous hyperesthesia, a decrease of the muscular sense and abolition of the baresthetic, osseous and thermic sensation. On the side opposite the lesion, there will be no paralysis, but there is anesthesia excepting for deep-seated sensation, which remains.

In hemisection of the cord, the reflex disturbances follow the rule of total division, but they are unilateral and on the side of the lesion. The electrical disturbances are very manifest on the side of the lesion, but usually there is no reaction of degeneration. There are four types of syndromes of irritation encountered, according to the site and extent of the compression, namely: (1) spasmodic quadriplegia; (2) spasmodic paraplegia; (3) spasmodic hemiplegia, and (4) spasmodic monoplegia. Spasmodic paraplegia is unquestionably the type most commonly met with and is characterized firstly by motor disturbances. The patient lies in bed with the lower limbs extended; or they may be rendered motionless by a contracture which prevents the displacement of their component parts. Spontaneous or provoked muscular shocks, stiffness or cramps are present.

The sensory disturbances are characterized by pains having a radicular topography, with or without a change in deep-seated sensibility; more common when the object of compression irritates the posterior roots; their exact localization may very materially help the diagnosis of the localization of the lesion. Hyperesthesia is of diagnostic import.

The reflexes are increased and Babinski's sign and patellar and ankle clonus are present; sphincteric tonicity exaggerated, manifested by retention of urine, constipation and priapism. Trophic disturbances are usually unimportant; there is no muscular atrophy nor edema, while bed-sores are not prone to exaggeration.

A purely compressive lesion rarely places the patient's life in jeopardy; the evolution is only bad from the resulting contractures which become organized at the same time as do the fibro-tendinous retractions.

In quadriplegia, the phenomena are the same, but all four limbs are involved. If there is simply a hemi-compression, there will be hemiplegia with contracture and Brown-Sequard's syndrome if changes have taken place in the parenchyma of the cord.

Symptoms of irritation or compression of the cord may result from a missile, bone splinter, hematorachis or intra- or extradural abscess.

If there is an aperture of entrance and exit, it is evident that the missile is not lodged in the spine or cord, but in the case of mitrailleuse shot, which are fired with great rapidity, two successive missiles may make only *one* entrance aperture, one of them making its exit, the other remaining embedded in the spinal canal. This circumstance is most uncommon, but it is possible, as has been proved by a few authentic instances.

In the case of compression from a bone splinter, radiography is our surest means of diagnosis. However, the bit of bone may be overlooked and it is also a fact that when the agent of compression is a missile or bone splinter the paraplegic manifestations follow immediately upon the receipt of the injury.

With a manifest syndrome of irritation, and an X-ray examination proves negative, hematorachis should be considered. Although the symptom is not absolute, in most cases there will be a certain interval between the receipt of the injury and the appearance of the paraplegia. Again, hematorachis usually causes very marked compression, but this is recovered from as little by little the clot undergoes absorption. Lumbar puncture discloses a more or less blood-tinged cerebrospinal fluid, if the blood has spread into the spinal canal.

Abscesses are not common and are difficult to differentiate from hematorachis. However, a tardy, slow and progressive syndrome of compression, with intermittency (subordinated to the possible escape of the purulent collection through the wound, followed by repair) the septic condition of the wound and elevation of the temperature should lead the surgeon to suspect abscess formation.

THE CLASSIFICATION OF THE SYNDROMES OF ASSOCIATED LARYNGEAL PARALYSES.—Maurice Vernet, *Medical Review of Reviews*, August, 1918, studies briefly the anatomy and physiology of the pneumo-gastric, glosso-pharyngeal, spinal accessory and hypoglossal nerves, one or more of which may be involved by disease or injury, the syndromes of which he discusses at length.

Serious difficulties are encountered in the study of this subject both in the classification and in the representation of the syndromes. Up to the present, our knowledge of the precise distribution of these cranial nerves or the significance of disturbances dependent upon them has been slight; there has been lack of correct method of investigation of the subject; the multiplicity of forms which have been described have not fitted into the framework which has been provided for them, and again, new authors appear with new sets of syndromes so that confusion continues.

The author believes that the difficulty lies less in the variety of combinations or syndromes which have been presented than in their signification or representation.

From the review of the literature of the subject as given, it is obvious that the variety of paralytic combinations may extend inordinately.

It has been proposed to designate the syndromes by the names of the organs injured, thus doing away with proper names in the classification; however, there are objections to such a designation, viz., certain paralyses would require long and clumsy names, such as glosso-palato-scapulo-laryngeal hemiplegia, besides these designations would not be at all times clear.

The author points out the objections to some of the classifications, and concludes by suggesting a classification in which he proposes to designate each paralysis or each paralytic syndrome by each or all of the nerve-trunks concerned, which he believes to be an exact, as well as a complete, classification which does not exclude from the clinical list the sensitivo-sensorial syndrome, as, for example, the pulmonic or cardiac.

A diagram is made to represent the various combinations of associated laryngeal paralyses of the last four cranial nerves, including the internal branch of the eleventh, which is the nerve of the larynx.

In order to make the matter clear and definite, a list of the principal symptoms which result from a lesion of the last four cranial nerves, is given, viz.: paralysis of the IXth nerve occasions a paralysis of the superior constrictor of the pharynx (curtailed movement of posterior wall, disturbance of deglutition of solids), and a disturbance of taste of posterior third of tongue. Paralysis of the Xth nerve causes disorders of sensibility of half of the soft palate, pharynx, larynx and of the auricular branch, also disorders of salivation, coughing crises and respiratory disorders (intermittent dyspnea and pseudo-asthma). Paralysis of the XIth nerve (internal branch) produces paralysis of half of the soft palate, half of the larynx and acceleration of the pulse. Involvement of the external branch causes paralysis of the sterno-cleido-mastoid and trapezious muscles. Paralysis of the XIIth nerve is followed by hemiplegia of the tongue.

All of the above syndromes may follow a bulbar lesion, but as a rule they are associated with some other disease of the central nervous system, as tabes, sclerosis in patches, syringomelia, etc., etc., in the frame of which they are merely an epiphenomenon, a symptom.

Each simple syndrome is by some considered as peripheral, all others as central, though it cannot be positively stated that all simple syndromes are peripheral; cases occur in which the diagnosis of the topographical lesion and still more definitely the etiological factor or factors cannot be definitely determined.

Contrary to former belief, disturbances of sensation of the pneumogastric and glossopharyngeal nerves is present in paralyses of bulbar origin as well as in those of radicular or peripheral origin. The reaction of degeneration cannot be taken as characteristic of paralysis of peripheral origin.

The author believes that a diagnosis may be more accurately determined by a careful clinical study of the case than by thinking only of the lesional topography, *i. e.*, the mode of onset, the way in which the symptoms progress, the disturbances of sensation and of motion, the ocular and pupillary signs, the reflex movements, etc., etc.

The solution of the clinical problem is only possible where a given syndrome is clearly defined anatomically and physiologically.

NEURO-THERAPY.

Treatment of Central Nervous Syphilis.—Carlill, *The London Lancet*, in a lengthy article, summarizes as follows:

1. The possibility of a syphilitic basis should be considered in every case of nervous disease.
2. Nervous syphilis can be proved by examination of the cerebrospinal fluid. The examination of the serum, whether the Wassermann reaction is positive or negative, is of little value in the diagnosis of these cases.
3. Provided that the diagnosis is made early, and prompt treatment given in adequate quantity, syphilis of the nervous system appears to be curable in very many cases.
4. The real result of treatment can only be determined by repeated examination of the cerebrospinal fluid, hence the absolute necessity of painless lumbar puncture.
5. Cases in which this operation has been contraindicated have not been observed.
6. Some cases of curable meningovascular syphilis are diagnosed as incurable dementia paralytica, and treatment is withheld.
7. Even in some cases of long standing tabes dorsalis the syphilis appears to be entirely curable by treatment, and in nearly all cases symptoms can be greatly alleviated by "606."
8. Novarsenobillon, in Carlill's hands, has proved a safe and most efficient remedy against the protean ravages of the *Spirochæta pallida*.
9. Galyl is not recommended.
10. The outlook of sufferers from early neurological syphilis is very bright, and will be brighter still when the general standard of knowledge of neurological diagnosis is less inadequate than it is today.
11. If the profession and the public seize and apply our present knowledge of syphilis it is not too much to hope that future generations of students will learn of tabes dorsalis and dementia paralytica only from the text-books.
12. Abolition of the ankle-jerks is an early sign, and often the only one, of arsenical neuritis, and may be demonstrated in the absence of any subjective symptoms.

PSYCHOLOGY.

Relations of Congenital Syphilis to Mental Deficiency.—William H. Higgins, *American Journ. Medical Science*, April, 1918, CLV, 549, after reviewing briefly the literature in regard to his subject, which shows a growing appreciation of the importance of syphilis as a factor in mental deficiency, gives an account of the results of his examinations of the first 50 cases admitted to the psychological clinic of the Medical College of Virginia during the past year. This material was drawn largely from the retarded classes of the Richmond Public Schools, the juvenile court, and other agencies interested in the social welfare of the city. Psychological, neurological and physical examinations were made and in addition Wassermann reactions were performed. Of the total number, 21 (42 per cent.) gave positive Wassermann reactions. From the accompanying chart it is seen that the series is composed largely of middle and high-grade imbeciles, with only an occasional low-grade idiot. With two exceptions the general health of the children was uniformly good, a fact which made it difficult to impress upon the families the necessity for persistent treatment. There was a striking absence of evidence of congenital syphilis or organic lesions of the central nervous system when compared with other reports. The most interesting and suggestive physical defect was malformation and caries of the teeth. In only 2 of the 21 cases were the teeth even approximately normal. No typical Hutchinsonian teeth were observed.

The recognition of the syphilitic factor is of importance, since the authors quoted by the writer, including Gordon, Donne, and Fournier, agree upon the possibility of improvement with suitable therapy.—*Cleveland Med. Journ.*

INDEX.

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ORIGINAL CONTRIBUTIONS.

	PAGE
Adolescent Dementia, Simple	91
Alcoholism and Morphinism, The Psychology of	1
Brain, The, and Genetic Function	97
Brief Survey of Two Thousand Five Hundred Prisoners	201
Case of Possible Insolation	276
Cerebellar Artery, the Posterior-Inferior, Thrombosis of	123
Cerebro-Spinal Axis in Poliomyelitis, The Haematogenous Invasion of	24
Conus Medullaris and Cauda Equina, Syndrome of, Apropos of a Case of Hemi-Lesion	85
Dementia, Simple Adolescent	91
Diagnosis of Feeble-Minded Individuals	17
Diagnostic Features in Clinical Types of the Feeble-Minded	35
Erotomania, Some Clinical and Historical Notes on	49
Fear of His Hands With Psychoanalysis of Same	298
Feeble-Minded, Diagnostic Features in Clinical Types of	35
Feeble-Minded Individuals, Diagnosis of	17
Genetic Function, and the Brain	97
Haematogenous Invasion of the Cerebrospinal Axis in Poliomyelitis	24
Insanity, The Relations of Various Courses of Life to	286
Insolation, A Case of Possible	276
Interrelation of the Community and the State Insane Hospital	197
Juvenile General Paralysis, Pathological Findings in Three Cases of	8

PAGE
Kleptomania; Its Causes and Treatment........ 230
Mechanism of Pain........ 169
Medical Witness, The........ 118
Mental Disorder, The Signs of........ 253
Morphinism and Alcoholism, The Psychology of........ 1
Nervous Diseases, The Relation of the Eye to........ 292
Pain, The Mechanism of........ 169
Paraesthesia, A Study of........ 45
Pathological Findings in Three Cases of Juvenile General Paralysis, The........ 8
Poliomyelities, The Haematogenous Invasion of the Cerebrospinal Axis in........ 24
Posterior-Inferior Cerebellar Artery, Thrombosis of........ 123
Prisoners, A Brief Survey of Two Thousand Five Hundred........ 201
Psychology of Morphinism and Alcoholism, The........ 1
Relation of the Eye to Nervous Diseases........ 292
Relations of Various Courses of Life to Insanity........ 286
Sex, On the Study of the Question of........ 109
Signs of Mental Disorder........ 253
Simple Adolescent Dementia........ 91
Some Clinical and Historical Notes on Erotomania........ 49
Study of Paraesthesia........ 45
Study of the Question of Sex........ 109
State Insane Hospital, The Interrelation of the Community and the........ 197
Syndrome of Conus Medullaris and Cauda Equina Apropos of, A Case of Hemi-Lesion...... 85
Thrombosis of the Posterior-Inferior Cerebellar Artery........ 123
Treatment, Kleptomania, Its Causes and........ 230
Vagatonia. 295

SELECTIONS.

Clinical Neurology.

Acute Febrile Polyneuritis........ 56
Asthenia, Neuro-Circulatory, and Its Management........ 310
Asthma. 139
Autoserum Treatment of Chorea........ 57
Backache, Variations in the Lateral Processes of the Fifth Lumbar Vertebra in the Etiology of.... 136
Back Lesions, Value of Diagnosis in........ 139
Blood and Cerebrospinal Fluid in Three Hundred Known Cases of Syphilis........ 134
Brain Injuries, With or Without Fracture of the Skull, Diagnosis and Treatment of........ 306
Case of Hypopituitarism........ 249
Case of Paramyoclonus Multiplex........ 246
Cerebrospinal Fluid and Blood, in 300 Known Cases of Syphilis........ 134
Cerebrospinal Meningitis, Epidemic, The Intravenous Serum Treatment of........ 314
Chorea, The Autoserum Treatment of........ 57
Claustrophobia, A Case of........ 57
Comparative Value of the Wassermann, the Colloidal Gold and Other Spinal Fluid Tests...... 248
Diagnosis and Treatment of Brain Injuries, With or Without Fracture of the Skull........ 306
Diagnosis in Back Lesions, The Value of........ 139
Differential Diagnosis of Neuroses........ 246
Divided, Completely, Spinal Cord in Man, Reflex Functions of........ 311
Drug Addiction and Modern Methods for Its Control........ 145
Drug Treatment of Morphinism........ 62
Ductless Glands, Epilepsy and the........ 247
Early Symptoms of Locomotor Ataxia........ 245
Emotive Psychoneuroses; Two Cases........ 245
Epilepsy and the Ductless Glands........ 247
Etiology and Specific Treatment of Hay Fever........ 60
Etiology of Backache, Variations in the Lateral Processes of the Fifth Lumbar Vertebra........ 136
Habit Spasm (Tic) and St. Vitus Dance, So-Called........ 59
Hay Fever, Etiology and Specific Treatment of........ 60
Headache Due to Nasal Disease........ 144
Hyperthyroidism, Ten Years' Serum Treatment in........ 314
Hypopituitarism, A Case of........ 249

PAGE
Hystero-Traumatism with So-Called "Physiopathic" Syndrome Cured by Re-Education 141
Inebriety from a Medical Viewpoint 61
Infancy, On the Development of the Nervous System During 140
Injuries of the Spinal Cord 312
Injuries, Psychogenous, of the Eyes in War 249
Intravenous Serum Treatment of Epidemic Cerebrospinal Meningitis 314
Kinesitherapy, and Massage, Writer's Cramp and Allied Affections: Their Treatment by 55
Locomotor Ataxia, Early Symptoms of 245
Madness and Unsoundness of Mind 138
Meningeal Hemorrhage in War Practice 311
Meningitis Sympathica 139
Mental Peculiarities as Symptoms in Stuttering 249
Morphinism, Drug Treatment of 62
Multiple Sclerosis, Syphilitic 309
Nasal Disease, Headache Due to 144
Nervous Diseases, A Plea for the Intensive Treatment of 139
Nervous Manifestations of Syphilis of the Eye 304
Nervous System During Infancy, On the Development of 140
Neuro-Circulatory Asthenia and Its Management 310
Neuroses, Differential Diagnosis of 246
Neurosyphilis, Treatment of Early Syphilis in Relation to the Development of 137
Paralysis Agitans and Its Treatment with Parathyroid Gland 304
Paramyoclonus Multiplex, a Case of 246
"Physiopathic" So-Called, Syndrome Cured by Re-Education, Hystero-Traumatism with 141
Poliomyelitis from the Standpoint of the Neurologist 143
Polyneuritis, Acute Febrile 56
Psychogenous Injuries of the Eyes in War 249
Psychoneuroses, Emotive; Two Cases 245
Psychoneuroses in War; War Shock: Psychology and Treatment 61
Reflex Functions of Completely Divided Spinal Cord in Man 311
Serum Treatment in Hyperthyroidism, Ten Years of 314
Spinal Cord, Injuries of 312
Spinal Cord Tumor 248
Spinal Fluid Tests, The Comparative Value of the Wassermann, the Colloidal Gold and Other 248
St. Vitus Dance, and So-Called Habit Spasm (Tic) 59
Stuttering, Mental Peculiarities as Symptoms in 249
Syphilis, Blood and Cerebrospinal Fluid in 300 Known Cases of 134
Syphilitic Multiple Sclerosis 309
Syphilis of the Eye, Nervous Manifestations of 304
Syphilis, Treatment of Early, in Relation to the Development of Neurosyphilis 137
Treatment, Intensive, of Nervous Diseases, A Plea for the 139
Treatment of Early Syphilis in Relation to the Development of Neurosyphilis 137
Treatment, Paralysis Agitans, with Parathyroid Gland 304
Tumor, A Spinal Cord 248
Unsoundness of Mind and Madness 138
War Shock; The Psychoneuroses in War; Psychology and Treatment 61
Writer's Cramp and Allied Affections: Their Treatment by Massage and Kinesitherapy 55

Clinical Psychiatry.

Clinical Aspects of Late Katatonia 63

Experimental Neurology.

Electrocardiographic Observations in Toxic Goitre 315
Experimental Meningococcus Meningitis 316
Neutralization of Virus of Poliomyelitis by Nasal Washings 147

Experimental Psychiatry.

Results in Treatment of Paresis by Inunctions of Mercury and Drainage of Cerebrospinal Fluid 316

Experimental Psychology.

PAGE
Comparative Sensitiveness of Blind and Seeing Persons ... 148
Study of Blood Pressure in the Insane ... 318

Neuro-Diagnosis.

Appearance of the Fundus Oculi in Certain Intracranial Conditions ... 151

Neuro-Etiology.

Etiology of Arteriosclerosis ... 65
Functional Conditions in the Light of Head Injuries ... 65
Nature of Neuropathic Affections of the Joints ... 67

Neuro-Hygiene.

Overwork and Overstrain ... 68

Neuro-Pathology.

Central Nervous System, Toxi-Infection of ... 69
Lathyrism ... 70
New Pathology of Syphilis ... 319
Toxi-Infection of the Central Nervous System ... 69

Neuro-Surgery.

Cord Injuries in Spinal Fractures ... 320
Fracture of the Spine with Cord and Root Symptoms ... 152
Spina-Bifida—Its Operaive Treatment ... 153
Traumatic "Palsy" of the Upper Extremity in Children ... 322

Neuro-Symptomatology.

Classification of the Syndromes of Associated Laryngeal Paralysis ... 328
Symptomatology and Diagnosis of Wounds of Spine and Cord in Warfare ... 326
Symptoms of Acute Cerebellar Injuries Due to Gunshot Injuries ... 323

Neuro-Therapy.

Administration of Salvarsan in Concentrated Solutions ... 78
Central Nervous Syphilis, Treatment of ... 330
Ductless Glands Preparations, Pharmacology and Therapeutics of ... 76
Electrical Treatment of Infantile Paralysis ... 79
Goitre: Use and Misuse of Treatment ... 239
Infantile Paralysis, Electrical Treatment of ... 79
Intraspinal Medication in Treatment of Syphilitic Diseases of the Nervous System ... 79
Salvarsan, Administration of, in Concentrated Solutions ... 78
Syphilitic Diseases of the Nervous System, Intraspinal Medication in Treatment of ... 79
Treatment of Locomotor Ataxia by the Maloney Method ... 78

Psychiatry.

Aphasia in Relation to Mental Disease ... 243
Does a Paretic Gold-Sol Curve in Psychiatric Cases Always Indicate Syphilis of the Nervous System? ... 245
Emotional Hysteria ... 242

PAGE
Insanity and Nervous Diseases, Their Relation to Venereal Diseases ... 244
Mental Disease, Aphasia in Relation to ... 243
Mutism in the Soldier and Its Treatment ... 240
Nervous Diseases and Insanity, Their Relation to Venereal Diseases ... 244
Paretic Gold-Sol Curve in Psychiatric Cases, Does it Always Indicate Syphilis of the Nervous System? ... 245
Somnambulism ... 155
Stuttering Boy, The ... 153
Venereal Diseases, Their Relation to Insanity and Nervous Diseases ... 244

Psychology.

Hallucinations in the Sane ... 157
Psychological Parallelisms Between Speech Disorder and Oral English ... 81
Relations of Congenital Syphilis to Mental Deficiency ... 330

Psycho-Etiology.

Mental Imagery of Stutterers ... 159

Psycho-Physiology.

Fatigue, Relative, Laws of ... 160
Freudian Psychology ... 164
Laws of Relative Fatigue ... 160
Mentality of Those Who Commit Suicide ... 163
Psychology, Freudian ... 164
Psycho-Physiological Theory of Right-Handedness ... 161
Suicide, On the Mentality of Those Who Commit ... 163

Psycho-Therapy.

Treatment of Paresis ... 82

EDITORIALS.

Abuse of Sex Statutes ... 132
Clinic for the Treatment of Syphilis ... 53
Disappearing Girls and White Slaves ... 301
Dream Terminology, Freudian ... 234
Freud, Literary Forerunners of ... 233
Freudian Dream Terminology ... 234
Mental Torticollis, Psychanalysis of ... 127
Poliomyelitis Committee, Report of ... 54
Psychoanalysis ... 129
Psychanalysis of Mental Torticollis ... 127
Psychoneurosis, Traumatic ... 52
Psycho-Therapy ... 127
Sex Statutes, Abuse of ... 132
Sexual Indifference ... 234
Syphilis, Clinic for the Treatment of ... 53
Torticollis, Mental, Psychanalysis of ... 127
Traumatic Psycho-Neuroses ... 52
Treatment of Syphilis, Clinic for the ... 53
White Slaves, Disappearing Girls and ... 301

BOOK REVIEWS.—Notices, etc.

Clinical Manual of Mental Diseases ... 166
Dementia Praecox Studies ... 251
Diseases of the Nervous System ... 84

PAGE
Dream Psychology.......... 83
Hygiene, Mental, Principles of.......... 83
Locomotor Ataxia (Tabes Dorsalis), etc.......... 167
Mastery of Nervousness Based Upon Self Re-Education.......... 167
Mental Diseases, Clinical Manual of.......... 166
Mental Hygiene, Principles of.......... 83
Nervous and Mental Diseases.......... 168
Nervous and Mental Diseases, Locomotor Ataxia (Tabes Dorsalis): Introduction to the Study and Treatment of.......... 167
Nervous System, Diseases of.......... 84
Nervousness Based Upon Self Re-Education, Mastery of.......... 167
Principles of Mental Hygiene.......... 83
Psychoanalysis, Technique of.......... 252
Psychology, Dream.......... 83
Technique of Psychoanalysis.......... 252
Tubercular Predisposition, Three Clinical Studies in.......... 166

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CONTENTS FOR OCTOBER

ORIGINALS

The Signs of Mental Disorder. Translated from Kraepelin, Psychiatrie, Achte Auflage—By H. I. Gosline, M. D., Pathologist, New Jersey State Hospital, Trenton, New Jersey 253

A Case of Possible Insolation—By Emil Amberg, M. D., Detroit, Michigan 276

The Relations of Various Courses of Life to Insanity—By James M. Keniston, M. D., Portland, Me...286

The Relation of the Eye to Nervous Diseases—By Edward Livingston Hunt, M. D., Assistant Professor of Clinical Neurology, Columbia University, New York City..........292

Vagotonia—By Beverley R. Tucker, M. D., Professor of Neurology and Psychiatry, Medical College of Virginia; Physician in Charge of the Tucker Sanatorium, Richmond, Va..295

Fear of His Hands: With Psychoanalysis of the Same—By Owen B. Ames, M. D., Waterville, Me..298

EDITORIALS

Disappearing Girls and White Slaves........301

SELECTIONS

CLINICAL NEUROLOGY

The Nervous Manifestations of Syphilis of the Eye — Paralysis Agitans and Its Treatment with Parathyroid Gland—Observations Regarding the Diagnosis and Treatment of Brain Injuries, With or Without a Fracture of the Skull —Syphilitic Multiple Sclerosis — Diagnosed Clinically in Spite of Negative Laboratory Tests — Report in Neuro-Circulatory Asthenia and Its Management — Meningeal Hemorrhage in War Practice—The Reflex Functions of the Completely Divided Spinal Cord in Man—Injuries of the Spinal Cord—Ten Years of Serum Treatment in Hyperthyroidism—The Intravenous Serum Treatment of Epidemic Cerebrospinal Meningitis 304-314

EXPERIMENTAL NEUROLOGY

Electrocardiographic Observations in Toxic Goitre —Experimental Meningococcus Meningitis 315-316

EXPERIMENTAL PSYCHIATRY

Results of Treatment of Paresis by Inunctions of Mercury and Drainage of the Cerebrospinal Fluid......316

EXPERIMETAL PSYCHOLOGY

A Study of Blood Pressure in the Insane...318

NEURO-PATHOLOGY

The New Pathology of Syphilis 319

NEURO-SURGERY

Cord Injuries in Spinal Fractures —Traumatic "Palsy" of the Upper Extremity in Children 320-322

NEURO-SYMPTOMATOLOGY

The Symptoms of Acute Cerebellar Injuries Due to Gunshot Injuries—The Symptomatology and Diagnosis of Wounds of the Spine and Cord in Warfare—The Classification of the Syndromes of Associated Laryngeal Paralyses.. 323-329

NEURO-THERAPY

Treatment of Central Nervous Syphilis.....330

PSYCHOLOGY

Relations of Congenital Syphilis to Mental Deficiency 330

ANNUAL INDEX

Index 331-336

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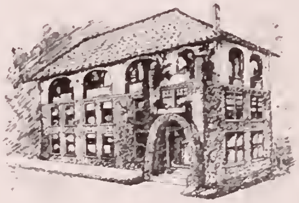

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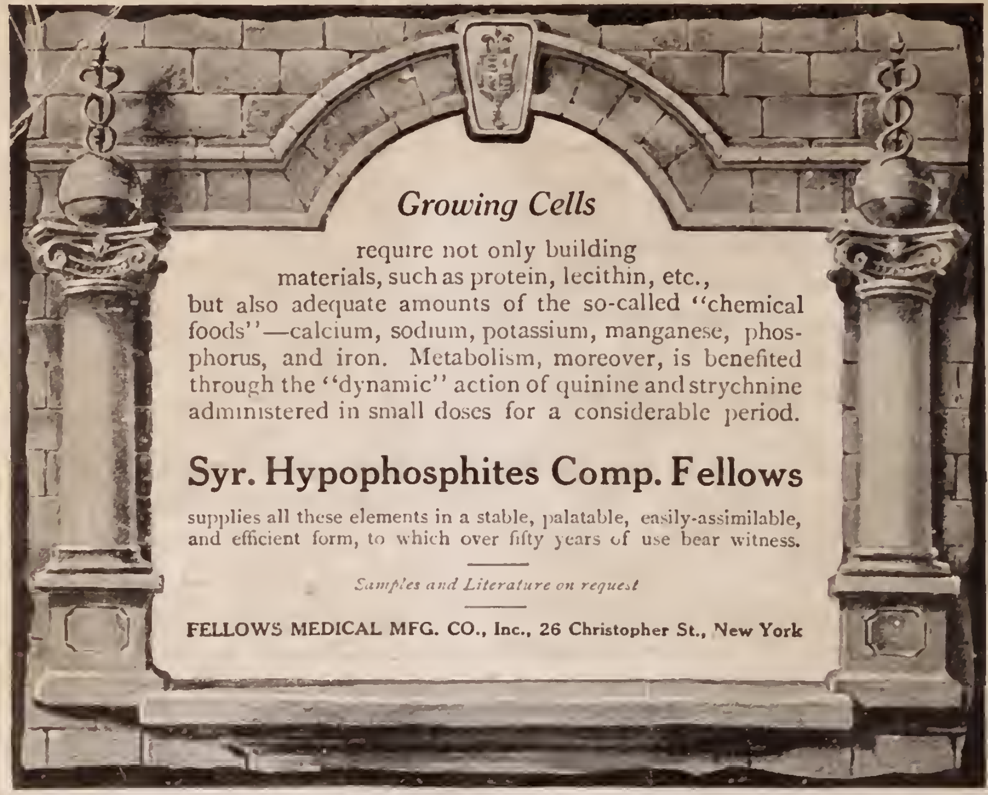

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